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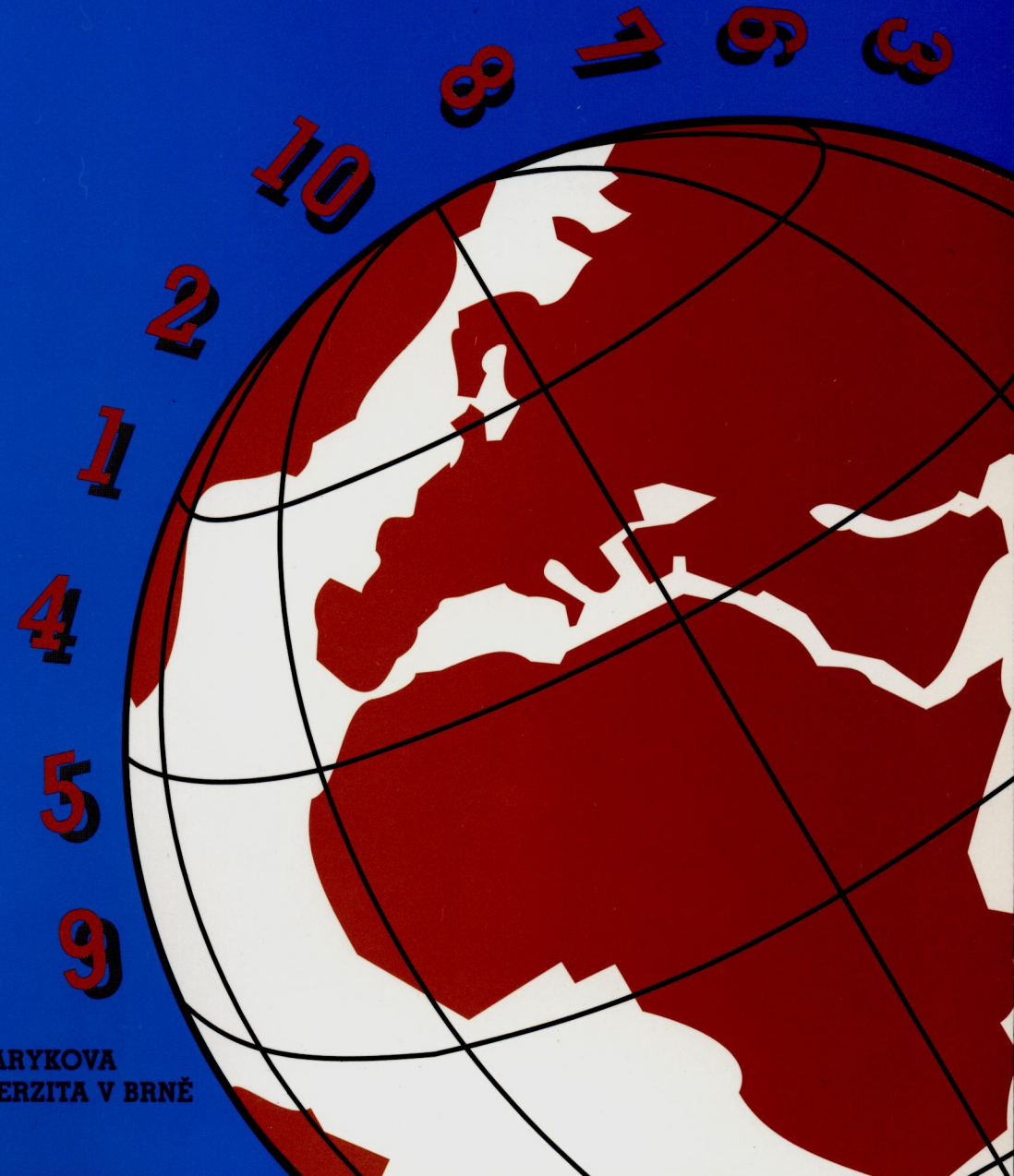
VÁCLAV BLAŽEK

NUMERALS.

COMPARATIVE-ETYMOLOGICAL ANALYSES AND THEIR IMPLICATIONS.



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N U M E R A L S

COMPARATIVE — ETYMOLOGICAL ANALYSES OF NUMERAL SYSTEMS AND THEIR IMPLICATIONS

(Saharan, Nubian, Egyptian, Berber, Kartvelian, Uralic, Altaic and Indo-European languages)

VÁCLAV BLAŽEK

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I was 12 years when I got a first serious text analyzing (among other things) Indo-European numerals. It was Adolf Erhart's textbook, *Sanskrt II. Historickosrovnávací mluvnice*, Brno 1971.

In the following years I have always been standing between mathematics and linguistics. I have studied mathematics & physics and taught these subjects 9 years. I could pursue my interest in linguistcs only in my free time. And only the 'Velvet revolution' provided me to graduate in doctoral studies in linguistics. More than 25 years after my first acquaintance with comparative-historical Indo-European linguistics mediated by Professor Adolf Erhart the same scholar advises me in my habilitation study of the numerals in Indo-European and 7 language families. I would like to express my deepest thanks him for his stimulation, valuable suggestions and many-sided help.

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INTRODUCTION

Numerals represent a specific class of words expressing quantity. The use of quantification undoubtedly belongs to the most important abilities of modern mankind. It is not possible to date this discovery. There is an archeological evidence demonstrating paleolithic roots of this knowledge. One of the most convincing is the wolf's radius-bone found at the Magdalenian locality Pekárna (Southern Moravia) covered by 30+25 incisions. The longer series has been interpreted as an astronomical record expressing perhaps the number of days in a synodic month (29,5 days). The shorter one was divided in pentads. Similarly also other late paleolithic discoveries, e.g. the carving of a horse head from the cave Arudy (France), or the rib from Novgorod-Seversk (Russia) — both with remarkable geometrical decoration, have been interpreted as counting (astronomical ?) records (Jelínek 1977: 424, 441, 452). In all known languages of the present and past, numerals exist and existed. It is probable that numerals are of the same age as the idea of counting, hence they could have to search no latter than the beginning the late paleolothic. It is symptomatic that the first signes in the oldest writing systems (Sumer, Elam) were numerical signes.

In the study of numerals there are at least three steps, logically following one another: (1) description; (2) structural analysis; (3) etymological analysis. The first serious study collecting and confronting the numeral systems of many languages of various language families was published by Pott already in 1847. In the 20th century there were two great attempts to describe the numeral systems of all known languages: that of Alfredo Trombetti (1916) and that of Theodor Kluge (1937–42). The first one collected a vast material, but the author discredited his undoubtedly considerable effort by seeking similarities between numerals to demonstrate monogenesis of all languages. Kluge's approach was more cautious: he tried to describe all numeral systems known in his time, analyzing only those formations which were quite transparent. Although his data are rather outdated and frequently inaccurate, if confronted with the recent results they can represent a valuable contribution even at present. In the nineties, Eugene Chan prepares the most detailed description of all the known numeral systems. Besides these global attempts, there are partial studies devoted to concrete language families. The serious studies are usually limited to the steps (1) & (2), while etymology has been omitted or its results are not too convincing.

The main targets of the present study are (a) to apply the methods of comparative-historical linguistics to the etymological analysis of numeral systems

in selected language families; (b) to formulate some general rules of creation of numerals in confrontation with the 'transparent' numeral systems.

The study consists of the parts A, B, C, divided into chapters: A. **Non-Indo-European numerical systems**: Saharan, Nubian, Egyptian, Berber, Kartvel, Uralic, Altaic; B. **Indo-European numerals**: "1", "2", "3", "4", "5", "6", "7", "8", "9", "10" (always with their ordinal correlates and corresponding tens), "100" and "1000"; C. **Patterns of creating numerals**. Every chapter represents an independent article including proper references. The language families in part A belong to those best described, including historical phonology and morphology; for every family there are special or at least partial studies describing and analyzing numerals (Petráček 1971 for Saharan; Meinhof 1918–19 for Nubian; Sethe 1916 and Loprieno 1986 for Egyptian; Woelfel 1954 for Berber; Klimov 1967 and Manaster Ramer 1995 for Kartvelian; Honti 1993 for Uralic; Ramstedt 1907, Kotwicz 1931 and Hamp 1970, 1974, for Altaic). The Indo-European numerals (B) represent the central part of the study. Here the most important deposits were realized by Ferdinand Sommer (1951), Oswald Szemerényi (1960), Werner Winter (1986[90]), Wolfgang P. Schmid (1989) and a team of scholars headed by Jadranka Gvozdanović (1992). In the final part (C), those numeral systems are studied whose semantic motivation of the individual numerals is transparent (body parts or arithmetic operations applied to existing numerals) and allows us to formulate some general rules of creation of numerals in human speech. The maximalist structure of each chapter/article studying an Indo-European numeral is as follows: All important forms including those from 'Restsprachen' are collected in agreement with the standard grouping, projected into partial reconstructions, usually of a late Indo-European ('Brugmannian') level, and organized in cardinals of the first decad plus the corresponding tens, ordinals, and if they exist, also multiplicatives, collectives, abstract nouns, members of compounds, various derivatives. On the basis of partial reconstructions a primary protoform is established. And it should represent a key to the etymology. Naturally, the existing etymological solutions are discussed too. If there are external parallels, they are also analyzed. The same scheme with a certain reduction is also applied to the non-Indo-European systems of numerals.

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SAHARAN NUMERALS

Dedicated to the memory of Karel Petráček

§1. The relationship of West Saharan languages (Kanuri & Tubu) was postulated by H. Barth (1854; in his letter to Lepsius). G. Nachtigal recognized the relationship of all Saharan languages (1879). He also concluded that the Western branch is more coherent than its relationship to Berti-Zaghawa. The internal classification of Saharan languages it is as follows (Cyffer 1981: 161; Petráček 1988: 129):

A. Western = TU-KAN (= Bodelean according to Ehret 1993: 105)
   a) KAN: Kanuri, Kanemu
   b) TU: Tubu, Tuda = Teda-Daza
B. Eastern = BER (= Ennedian according to Ehret 1993: 105)
   a) BERI: Zaghawa, Bideyat
   b) SAGA: Sagato-a = Berti

It is almost generally accepted that the Saharan language family belongs to the vast Nilo-Saharan macro-phylum.

Greenberg (1963: 130) offered the following high-level classification of Nilo-Saharan languages:

A. Songhai, B. Saharan, C. Maban, D. Fur, E. Koman & Gumuz, F. Chari-Nile (consisting of Berta, Kunama, Central Sudanic, Eastern Sudanic).

Bender (1992: 15–39) places the Saharan family among "isolated outliers" together with Songhai, Kunama and Kuliak, against the "peripheral satellites" (Maban, Fur and Central Sudanic) and the "core group" (Berta; Nubian, Nara, Nyima, Tama; Surma, Jebel, Temein, Daju, Nilotic; Koman, Gumuz; Krongo-Kadugli).

Ehret (1993: 104–106) divides Nilo-Saharan into Koman (incl. Gumuz) and Sudanic, consisting of Central and Northern Sudanic. The latter super-branch is divided into Kunama and Saharo-Sahelian. The term Sahelian is used for Songhai, Fur, Maban and Eastern Sudanic.

On the other hand, Petráček (1988: 133) admits only areal connections among Songhai, Maban and Saharan languages and rejects the Nilo-Saharan hypothesis in the genetic plan.

§2. Unfortunately, a complete comparative historical phonology of Saharan languages has not been written so far, although some partial phonetic rules

were formulated (Cyffer 1981a; 1983; Petráček 1988). The asterisked forms used here represent only hypothetical projections allowing to explain the creation of the descendant forms.

§3. The first internal analysis of Saharan (Kanuri) numerals was presented already by F. Müller (1877: 210). Kluge (1937) collected the basic data about Saharan numerals and compared them with Nilo-Saharan counterparts. The most detailed internal analysis of the numerals of all Saharan languages was presented by K. Petráček (1971: 246–252).

§4. The most important forms are collected in the following tables:

Numerals of KAN-group

	Kanuri Lukas	Kanuri Cyffer	Kanuri Bowdich	Maïha Barth	Kanuri Clarke #125	Kanuri Clarke #126	Kanuri Clarke #128	Kanuri Clarke #273	Kanembu Lukas
1	*tiló*	*tiló*			*tilo*	*ielo* !			*tullǫ́*
	láskǫ́	*láská*	*leskar*	*lagen*			*lakka*	*lazka*	
	fál	*fál*							
2	*indí*	*indí*	*ahndee*	*indē*	*andi*	*inde*	*endi*	*indi*	*yindí*
3	*yǫ́skɔ́*	*yakkɔ́,°skɔ́*	*yaskar*	*eäska*	*iaska*	*yasko*	*niesku*	*zesku*	*yaakú*
4	*dégɔ́*	*dégɔ́*	*deegah*	*daüger*	*dega*	*dago*	*diku*	*degu*	*ďéu*
5	*úgù*	*úwu*	*ooögoo*	*ohoo*	*ugu*	*ooogoo*	*oku*	*ugu*	*(y)ûû*
6	*ǫ́rǫ́skɔ́*	*arakkɔ́*	*araskoo*	*araska*	*araska*	*araska*	*araska*	*araska*	*arakú*
7	*túlùr*	*túlur*	*tooloor*	*tooloor*	*tulu*	*toulur*	*tullori*	*tullu*	*túlur*
8	*wuskú*	*wuskú*	*woskoo*	*weska*	*uosku*	*waskoo*	*hasku*	*wuskee*	*yusukú*
9	*ləgár*	*ləgár*	*likkar*	*lekar*	*lagiri*	*lakao*	*lilkar*	*lakar*	*laar*
10	*megú*	*mewú*	*meeägou*	*magoon*	*miagu*	*meagou*	*miiko*	*megu*	*m'eű*
20	*fíndì*	*fíndí*							*fíndi*
30	*fyǫ́skɔ́*	*fyákkɔ*							*fíaku*
100	*(mę́ǫ́)*	*(meǫ́)*							*yǫ́ru / (mia)*
200	*yôr indí*	*yôr indí*							

Numerals of TU-group

	Kaširda Lukas	Borku Nachtigal	Daza Jourdan	Kreda Lukas	Tuda Nachtigal	Teda Müller	Tubu Carbou	Tubu Decorse	Goran Decorse
1	*turǫ́n, trǫn, trǫn*	*tron*	*trono, tra*	*tərnóo, trǫn*	*toroo, tron*	*toroo*	*tron*	*torôna*	*torôdna*
2	*cuu*	*cu*	*cu*	*cuu*	*kyuu, tyuu*	*tšuu*	*ču*	*ţu*	*ţyu, ču*
3	*akkuzúu, aguzó*	*ógozoo*	*agozo*	*aguzúu*	*óguzuu*	*agozoo*	*agozu*	*agozu*	*akuzo, aţuzun*
4	*tuzzóo, °ǝ́ǝ*	*tózoo*	*tozo*	*tozóo*	*tózoo*	*tozoo*	*tuzô*	*tuzo*	*tuzo*
5	*fooú, fǝǝú*	*foo*	*fo*	*foú*	*foo*	*foo*	*fôu*	*fohu*	*fó, fu*
6	*dessíi*	*disee*	*dissi*	*dist*	*dísee*	*disii, disee*	*dessé*	*desi*	*desi*

	Kaširda Lukas	Borku Nachtigal	Daza Jourdan	Kreda Lukas	Tuda Nachtigal	Teda Müller	Tubu Carbou	Tubu Decorse	Goran Decorse
7	*túdusuu*	*tɔ́desuu*	*tuduzu*	*túrusu*	*tɔ́desuu*	*turressioo*	*tudussu*	*tudusu*	*tudusu, turesu*
8	*wússuu*	*ósoo*	*osso*	*ɔ́ssu*	*yɔ́suu*	*osoo, yïsuu*	*osso*	*usïl*	*usïl, usu*
9	*yisíi*	*isii*	*issi*	*yisíi*	*išii*	*isii, yesee*	*issi*	*isi*	*isi*
10	*múrdǫm, múra*	*múrdom, múroo*	*mordom*	*mɔ́rdǫm, mɔ́rdəm*	*múro*	*murdoo*	*merdôm, mordôm*	*mordom*	*mordum*
20	*dígidəm*		*digidəm*	*dígirəm*	*dútyuu*	*dukkiuu*	*digidom*	*digidem*	*digidem, degerem*
30	*mərtá aguzúu*	*morta ógozoo*	*morta agozo*	*mərtá aguzó*	*murtá óguzuu*	*mortaguzuu*			
40	*mərtá tuzzóo*	*morta tozo*	*mərtá tozóo*	*murtá tozo*					
100	*kídri*	*kédree*	*kidri*	*kíndəri*	*katree*				

Numerals of BER-group

	Bideyat	Zaghawa	Zaghawa	Berti = Sagato-a			
	Chalmel	Tourneux	MacMichael	Spence	Arkell	MacMichael	Holý
1	*néko*	*nǫǫkǫ̀*	*lakoi*	*sang*	*saang*	*sa(ng)*	*sang*
2	*sui*	*súí*	*sué / šué*	*su*	*su*	*su*	*su*
3	*ué*	*ụụ̀*	*wé*	*soti*	*soti*	*soti*	*soti*
4	*ěšté*		*išté*	*sitti*	*sitti*	*sitti*	*sitti*
5	*hué*		*huué*	*pii*	*pi*	*pi*	*bi*
6	*dèštè*		*dešté*	*dowiti*	*duti*	*duuti*	*duti*
7	*dešté*		*dišté / distii*	*taiti*	*teiti*	*taiti*	*taiti* "10"!
8	*uèttè*		*(w)otté*	*kuze*	*kuzi*	*kuuzi*	*kuze*
9	*dišti*		*distii / dištii*	*kedoesi*	*kadussi*	*kiddasi*	*kizaiti*
10	*sagoti*		*timm(i)*	*masang*	*massung*	*musa(ng)*	*masang* "7"!
11			*gé lakoi* "another one"	*saamaarr*	*mesang ni saang mer*	*mussang sa ma*	
12			*gé swé* "another two"	*sumarr*	*messang im se mer*	*mussang su ma*	
13				*sotimarr*	*messando soti mer*	*mussang soti ma*	
20			*timm swé*	*masu*	*mesando*	*mussu*	
100					*umur*	*ommar*	

§5. Comparative-etymological analysis

1.1. Kanuri *tiló* & Kanembu *tullǫ́* "1" can reflect pKAN **tulCo*, maybe syncopated from **tuliCo* which would explain the vowel *i* in Kanuri (*C* means any consonant). The corresponding counterpart is pTU **turono*. Assuming a correspondence of the suffixal extensions, pKAN **-Co* means **-no*. Etymologically the root **tuRo/i-* (*R* = *r* or *l*) can be identified with the first member of the Saharan word for "fingernail": Tubu *turkano, turkɔme*, Teda-Daza

turkɔn, Zaghawa *targ̀wi* "fingernail, toe, claw". The second componet also appears in Kanuri *fə̀r-gámi* "fingernail" (Mukarovsky 1981: 203), cf. Kanembu *gandíi*, Kanuri *gámbùskin* "to claw, scratch" — see Lukas 1931: 107). The closest external cognate is Fur *tori* "finger" (Meinhof). Greenberg (1963: 138) adds Surma: Tirma *teri* // West Nilotic: Burun *tuli* id.

The semantic shift "fingers (of a hand)" = "5", allows to enlarge the related forms, cf. Maban: Masalit (Edgar) *tur* = (MacMichael) *tóro*, Maba *t(ú)ur*, Aiki *túur*, Kibet *tur* (all Edgar), Mabang *tura*, Runga *tor*, Kodoi *dur* (all Gaudefroy-Demombynes) "5" // Surma: Majang *tul*, Shabo *tuul*; Didinga, Murle, Longarim, Bale, Zilmamu *tur* "5" (Fleming 1983: 541) // Kuliak **tud* "5" (Fleming 1983a: 440) // Taman: Tama *tor*, Erenga *toř*, *túř*, Sungor *tɔ̀r*, Miisiiri *toř*, Maraariit *túur*, Abu-Shaarib *tur* "6" (Edgar 1991: 121), originally "5+[1]" or "a finger [in addition]" (?), cf. Mimi (Gaudefroy-Demombynes) *tulgu* "6" < Maban **tur-* "5" & Mimi *deg* "1" ? The meaning "5" can also be reconstructed for the first member of the numeral "7" in pKAN **tullor* and pTU **tudesu* or **turesu* = "5 + 2" (see 7.1.).

1.2. The variants of Kanuri *láská* (Cyffer) = *lazka* (Clarke #273) = *lakka* (Clarke #128) = Nguru *laku* (Koelle), indicate the original **laSKa* (Cyffer 1981a: 14; 1981: 173). The closest cognates in Zaghawa (MacMichael) *lakoi*, (Tourneux) *nɔɔkɔ̀*, Bideyat (Chalmel) *néko* "1", and the external parallels, indicate an older sequence **laKSa*, analyzable in **laK-* & **-Sa*. The first member is perhaps related to Kanuri (Lukas) *lágạ* "certain, some" = (Cyffer) *láá* "some". There are also promising cognates in other Nilo-Saharan branches: Borgu (a puzzling language described by Meinhof & Klingenheben) *lọk* "1" // Jebel: Aka *liigiidii*, Silak *lĭgĭdĭ*, Kelo *lɔ́ɔdě*, Tornasi *loodi*, Molo *leédě*, Malkan *leedi* "1" (Bender 1989: 152) // ? Daju: Liguri *nohorok*, Shatt *nuxu*, Nyala & Lagowa *nowane*, Sila *uŋun* "1" (Thelwall 1981: 182) // Berta: Wa-Kosho *ma-nak'u*, Fadasi *ma-naγu*, Gamila *mi-diku* etc. "1" (Cerulli 1947: 161 reconstructed **l*). The component **-Sa* is comparable with Berti *sa(ng)* "1" (cf. also Kanuri *sái* "only, except") — see #1.4.

1.3. Kanuri *fál* "1" resembles remarkably Songhai *follo* "1" (Hacquard-Dupuis) = Djarma *afaláŋ* (Westermann). Kaben (Maban family) *faya* "1" (Nougayrol) can be related too.

There are similar forms in Central Chadic: Mandara *pállɛ́*, Mofaw *pál*, Kotoko (Lebeuf): Makeri & Gulfei *pal* "1" (Mukarovsky 1987: 280).

1.4. Berti *sa(ng)* "1" is perhaps related to Kanuri *sái* "only, except" (cf. also pKanuri **laSKa* < **laK-Sa* ? — see §1.2.). External parallels also exist: Fur *soṅa* "all" (Meinhof) // Maban: "Wadai" *sen* "1" (cf. Kluge 1937: 217) // Kuliak: Ik *ṣa* "other" // Koman: Kwama *seendo*, South Koma *aseni* "1" (Bender).

2.1. The KAN variants *yindí / indí / endi / andi* "2" could indicate a protoform **yandi*, formally derivable from **sandi* (Cyffer 1983: 63, 70; but he prefers to reconstruct here **ʔěndí* with a gottal stop — ibid. 65, 75). It is tempting to connect this hypothetical construct with Berti *-sando* recorded by Arkell in

mes(s)ando "20" vs. *massung* "10". The comparison with *mus(s)a(ng)* "10" = "10 x 1" & *mussu* "20" = "10 x 2", recorded by MacMichael, indicates the meaning "2" for *-sando* (Petráček 1971: 250 proposed a different analysis: *me-san-do* "hand x one + pl."). The segment **-and-* of the numeral "2" corresponds suggestively with the plural marker **-and-* of personal pronouns in Kanuri (Cyffer 1981: 171). The bare root **sV-* can be connected with the preceding root **sa...* "one"; hence *"one" + plural > "two" ? The second possible etymology could be based on the numeral **sui* "2" (#2.2.).

2.2. Berti *su*, Zaghawa *sui / sué / šué* and TU **cuu* < **ciu* can be derived from an archetype of the type **sui* or **cui* "2". The external cognates within Nilo-Saharan support this reconstruction: Maban: Mimi (Nachtigal) *soen* "2" // Koman: Komo *sowɛn*, Twampa *sû'*, Anej *dû-sûit*, Kwama *s(w)iiya*, Opo *suka* (all Bender), Gule *dessú* (Seligmann), Fungi *di-suik* (MacMichael) "2" < **suik* or **suit* ?; Ehret 1983: 417 reconstructs **su?i* // ? Central Sudanic **so* "4" (Bender 1992: 41, #64), cf. Kresh *sɔsɔ*, Woro, Dongo *sǫǫs* "4" (Santandrea), and Bagirmi *sab* "2" (Gaden) = Central Sudanic **θu(ɔ)* according to Ehret (1983: 417; he compares Saharan + Koman + Central Sudanic).

3.1. Common KAN **yasku* "3" admits more variants of internal reconstruction. Thus Cyffer (1983) derives KAN **y-* from **?-*, **k-/*g-*, **t-/*d-*. The cluster varying in *-sk-/-kk-/-k-* can reflect **-SK-* or **-TK-* (Cyffer 1981a: 14; Id. 1981: 173). Starting from the fact that the KAN numeral **wusuku / *wasuku* "8" represents the sum "5 + 3" (see #8.1.), the original pKAN numeral "3" could look **?asuku*. This form is compatible with pTU **akuzu* "3" via metathesis. The other combinations without any inner Saharan support are less probable: e.g. **yasku* < **t(y)asku* resembles better pNubian **tɔssik* "3" (Bechhaus-Gerst) than pNilotic **däk* "3" (Reh; Dimmendaal).

3.2. The common TU numeral **akuzu* "3" can be related with pKAN **?asuku* via metathesis (#3.1.). Lukas (1953: 16) demonstrated that the change *s* > *z* is frequent in TU-dialects. Berti *kuuzi* "8" (MacMichael) supports the sequence of consonants attested in TU. There is a possible external cognate in Daju **kodos* "3" & **kosande* "8" = "3 + hand" (Thelwall 1981: 183). On the other hand, Songhai-Djarma *ahaku* "8" (Westermann) stands closer to pKAN **?asuku* "3". The bare root *za* "3" in Songhai (the full stem *hinza* minus *hinna* "quantity") is questionable. Bender (1981: 261) connects Kanuri & Songhai numerals "3" directly, adding Fur *iis* "3", and some others.

3.3. Berti *soti* "3" has remarkable parallels in Mangbetu (Central Sudanic) *sɔ́ta* "3" (but Fer *wìtà*, Bongo *müta*, Bagirmi, Sara etc. *muta*, Yulu *mü(ü)ta*, Baka *ɔtă* "3" — see Bender 1981: 258) // Berta: Dul (Evans-Pritchard) *zitigini*, Bertat (Marno) *sittigini*, Wetawit (Bender) *sittijini*, Jebel Ura (Bender) *zítígíni* "3" // Kunama (Salt) *saddé*, (Bender) *saate*, Ilit (Bender) *satte* "3" // ? North Surma: Majang *jiit*, Shabo (Tefera & Unseth) *jiita* vs. South-East Surma: Meqen *sizzi*, Bodi *sízzi*, Tirma *sizi & dizi*, Mursi *sízzi* (all Haberland) = *θízzì* (Turton & Bender).

3.4. Zaghawa *wé* & Bideyat *ué* "3" have no evident cognates among Nilo-Saharan numerals, perhaps with the exception of Lendu (a proper branch of Central Sudanic) *(u)gbɔ̃* 3" (Tucker). An alternative solution can be based on the hypothetical reconstruction **ue* < **uðe*, supported by tempting Nilo-Saharan parallels: Jebel: Aka *éedé*, Silak *eede*, Tornasi *ede*, Malkan *odo*, Molo *ɔ́ɔdɔ́* (Bender 1989: 152–153); Tabi (Marno) *oda*, Hamej (Meinhof) *ŏda*, Gaam (Bender & Ayre) *ɔ́lɔ́* // Berta: Undu *mú-uθe*, Fadasi *mɔ́-ɔθe* (Bender) = *mu-uði* (Cerulli) etc. "3".

4.1. Common KAN **diga* "4" resembles suggestively Songhai (Prost) *tatyi* "4", *takanta* "4th", (Clarke) *a taki*, Djarma (Westermann) *itáaḱi* "4" (cf. already Müller 1877: 210). There are also similar forms in Koman (Bender), e.g. Komo *dɔgɔn-in*, Anej *duk-* "4", but Twampa *dóŋòn* and the *d*-prefix forming all the Anej & Fungi numerals lead to the protoform **d-oŋon*, representing the most wide-spread Nilo-Saharan form of the numeral "4": pNilotic **(ɔ)ŋwan* (Dimmendaal) // Surma: Majang & Shabo *aŋan* (Tefera & Unseth) // Fur *ɔŋal* (Beaton), Mimi *ɔ́ŋɔ́l* (Jungraithmayr) // Kuliak **nowa?* (Ehret) "4" // Central Sudanic: Moru-Madi **ńna* (Tucker); Mamvu *je-nɔ̀ǫ́* Balese-Obi *ècị-nà* "4" (Vorbichler) etc. No traces of the *d*-prefix indicating numerals in Saharan mean probably that KAN **diga* has a different origin. Ehret (1983: 416–417) mentions formally similar Gaam (Bender) *ḍaag*, Tabi (Marno) *diag* "2" // Surma: Kwegu *d'áà* (Bender), Yidinit *ḍa* (Haberland) "2" and West Nilotic **dAk* "3" (Reh), and speculates about "more general numerical meaning". The semantic compatibility of the numerals "3" with "2" and "4" is very problematic (varying denotations of fingers or spans ?) but the numeral "4" can be really derived from "2", cf. the examples from Central Kalahari Khoisan languages: G//ana & G/wi */am'/amchira* "4", derived from */ám* "2" (Tanaka). The original meaning "2" of the root **dig-* can be identified in TU "20", how it follows from confrontation with the numeral "10": Kaširda *digidəm* "20" vs. *múrdɔm* "10", Daza *digidəm* vs. *mordom* etc. Accepting this semantic reconstruction, the KAN numeral "4" can be analyzed as **diga* > **dig-* "2" + plural marker *ká*, originally perhaps *a* (Cyffer 1981: 181; cf. yet TU **-(y)a* — ibid. 162).

4.2. Common TU **tuzzo* "4" is comparable with Daju **tispet* "4" (Thelwall 1981: 183), esp. if the original form would be modified in **tiswet* in agreement with Baygo *teshwet* (MacMichael). It is tempting to see here a reflex of the numeral "2" discussed above (#2.2.) but the internal structure remains puzzling (**suitisuit* = "2+2" ?).

4.3. Berti *sitti* "4" is probably related to Zaghawa *išté* & Bideyat *éšté*. The starting protoform could be again something similar to**suitisuit* = "2+2", as in the preceding case. The external comparanda remain uncertain, perhaps Tabi (Marno) *jessu*, Hamej (Seligmann) *yieeza* "4" can be quoted.

5.1. Common KAN **vogu* "5" has the most hopeful cognate in Common TU **fohu* "5". Zaghawa-Bideyat *hu(u)é* and Berti *bi* / *pi(i)* are probably also related. On the proto-Saharan level one could expect an archetype of the type **βoγu* vel sim. Among Nilo-Saharan numerals the closest cognate appears in Songhai (Prost) *gu*, Djarma (Westermann) *igú* "5" (cf. already Müller 1887: 210). On the other hand, it is tempting to connect the numeral with the Nilo-Saharan etymon "arm, hand" attested in Berta (Halévy) *bue*, Rikabiyyah (Cerulli) *buwaa* "arm" // Surma: Kwegu (Bender) *búuà* "hand", Didinga *iba* "arm" (Fleming 1983: 541) // Central Sudanic: Bagirmi *boko*, Baka *baka* id. // ? Saharan: Berti *abi* "arm" (Greenberg 1963: 117, 133; Gregersen 1972: 80 adds also Niger-Congo parallels: Bantu **-bókò* // Dagomba *boγo* // Ubangian: Zande *bo*, Gbaya *baxa* etc.).

6.1. Common KAN **arasku* "6" resembles Daju **aran* id. (Thelwall) in the first part **ara...* But the Daju numeral can perhaps be restored as **aranda* in agreement with the following numerals: **paγtindi* "7" vs. **pidax* "2", **kosande* "8" vs. **kodos* "3", **tabistanda* "9" vs. **tispet* "4" and **ande* "arm, hand" (Thelwall 1981: 183, 175). The meaning of the first element **ar-* remains puzzling ("overcoming"?). On the other hand, in the KAN **arasku* "6", the KAN numeral **ʔas[u]ku* "3" (see #3.1.) can be recognized. Accepting it, the meaning of the first part should be "two / pair / both", hence **arasku* < **ar-* & **ʔas[u]ku* "2 x 3". The same structure appears in geographically closed languages of the Kotoko group (Central Chadic): Affade *frákurọ* "6" vs. *kákurọ* "3", Gulfei *frekra* vs. *akra*, Kuseri *vrekager* vs. *kager*, Logone *venašker* vs. *kašker* etc.; cf. Gulfei *fregande* "8" vs. *ngandé* "4", Kuseri *vregade* vs. *kade* etc. (Sölken 1967: 164–168, 175f). A similar pattern is known in some Kordofanian languages of the Heiban (= Koalib after Greenberg) family too: Kanderma (Seligmann) *rĕčičén* "6" = *kĕriičan* "2" x *kĕriičin* "3", in modern transcription Tira (Schadeberg) *lʈcíʈcin* "6" = *kʈcan* "2" x *kʈcin* "3". Bork (1912–13: 152) derived Kawama (Seligmann) *nĭrghil* "6" from **ñeri-k-toli* "2 x 3", cf. *toli* "3", in modern transcription Utoro (Schadeberg) *ɲírɛl* "6" vs. *ʧɛ́ʈɛl* "3".

The hypothetical meaning "2" of the pKAN root **ar-* can be supported by numerous cognates within Nilo-Saharan: Nilotic (Dimmendaal) **aRyɛw* "2" // Nara (Thompson) *arriga* "2" & *jariga* "7" // Nubian **arui* or **auri* "2" & Nile Nubian **arri* "20" // Taman **warri* "2" // Nyima (Meinhof) *warba* "2" // Fur (Beaton) *awu* "2" // Central Sudanic **(a)riyu* "2" // Krongo-Kadugli (Schadeberg): Yegang *aríya*, Krongo *yáária*, Miri *éɛ́ra* "2" // ? Bertat (Marno) *ari* "7" // ? Koman: Fungi (Marno) *ar* "20".

The KAN numeral "6" has penetrated in some Kotoko languages: Buduma (Koelle) *harasge* & *sarake*, Kuri (Decorse) *saraske* "6", with the *s*-prefix forming also the numerals "4", "8", "9", "10".

6.2. Common TU **disse* or **dessi* with *-ss-* < **-st-* (Lukas 1953: 21) has hopeful cognates in Zaghawa *dešté* and probably also in Berti *dowiti* // *du(u)ti* "6". In agreement with the analysis in #6.1. the internal structure "2

x 3" could be expected, maybe **dig-* "2" (cf. #4.1.) & **soti* "3" (#3.3.) > **diwsoti* ?

7.1. At first sight the common KAN **tullor* "7" seems to be quite isolated among Saharan numerals. But accepting the analysis of the common TU **tudesiu* or **turesiu* "7" = "[5] + 2" (#7.2.), it is natural to expect a similar structure also for the KAN counterpart. A similarity of the KAN numeral **tullo* "1" (#1.1.) maynot be accidental. It is possible to imagine the compound **tullo + *ugu + *ar* "[1x5] + 2" > **tullo + uwu + ar* > **tullor* & **tul(l)ur*, whose last member **ar-* *"2" was discussed above (#6.1.). An analogical multiplication appears e.g. in some Kordofanian languages: Talodi *č-e-kun-j-ilik* "5" vs. *y-ilik* "1" or Eliri *č-ebin-g-ela* "5" vs. *č-ebin* "hand", *elle* "1", hence "5" = "one hand" (Meinhof, *ZKS* 6[1915–16]: 252).

The KAN form of the numeral "7" was borrowed into all Kotoko languages: Affade *dûllo*, Ngala *tyllur*, Makeri *tulu(r)*, Gulfei *tul(l)ur*, Shoe *tulur*, Kuseri, Logone *ka-toli*, Buduma *túlǫr*, *tụloor* (Sölken 1967: 167–168, 176).

7.2. Common TU **tudesiu* or **turesiu* "7" can be analyzed *"x + 2", cf. **ciu* "2" (#2.2.). This identification implies x = "[1x]5" or "[one] hand". Perhaps a plausible solution can represent a compound **tur-* "1" (#1.1.) + Kaširda *jɛsú* "arm" (Lukas) + **ciu* "2" (#2.2.), hence "one arm plus two".

There is an alternative solution identifying the first member **tull-* in KAN and **tud-* // **tur-* in TU directly with one of the Nilo-Saharan etymons for "5" (cf. #1.1.): Surma (Haberland): Majang *tul*, Didinga, Longarim etc. *tur* "5" vs. Didinga *tur-ke-ramma* "7", Longarim *turu-ge-rem* "7" // pKuliak (Ehret)**tud* "5" // Maban (Edgar): Maba *t(ú)ùr*, Masalit, Kibet *tur*, Aiki *túur* "5"; Mimi (Gaudefroy-Demombynes) *tulgu* "6" = "5" + *deg* "1" ? (cf. Taman "6": Tama *tor*, Erenga *toř*, *tuř*, Sungor *tɔ̀r*, Maraariit *túur* etc. after Edgar 1991: 121) // Central Sudanic: Moru-Madi (Tucker): Pandikeri *túdweri*, Lulu'ba *túdieri*, Lokai *túderi* "7" = *tòu* "5" + (*e*)*ri* "2".

7.3. In Zaghawa *dišté* (*& distii*) and Bideyat *dèštè* "7", the numeral "4" (*išté* and *éšté* resp.) can be recognized. The initial *d-* can be (i) prefix (besides "6" cf. also "9") forming (some) numerals above "5", (ii) a conjunction (cf. #7.4.), or (iii) modified numeral "3". The latter solution is in a good agreement with the hypothetical reconstruction **ue* "3" < **uδe* (cf. #3.4.).

7.4. In the first syllable of Berti *taiti* "7" the conjunction *-ta* "and" (MacMichael) can be seen. If we accept it, could the numeral "7" represent the compound **soti-ta-sitti* *"3 + 4" > **tasitti* > **taiti* ?

8.1. Common KAN **wusuku / *wasuku* "8" represents very probably the sum **ugu* "5" + **ʔasuku* "3". The same structure can be expected in common TU **wossuu* "8". Could Zaghawa (*w*)*otté* & Bideyat *uèttè* "8" also represent the same pattern if the numeral is analyzed as *hu(u)é* "5" & (Berti) *soti* "3" > **uesti* > **ueste* > **uette* ?

The KAN numeral "8" was borrowed into some Kotoko dialects: Buduma (Koelle) *huasge* = (Decorse) *sooske* = (Barth) *soosku*, Kuri *soske* (Gaudefroy-Demombynes 1907: 276).

8.2. Berti *ku(u)zi / kuze* "8" agrees suggestively with common TU **akuzu* "3" (#3.2.). It is probable that originally this numeral also represented a compound *"5 + 3", and later its first member was lost.

9.1. In common KAN **lakkar // *likkar // *lakkir* "9", the assimilated variant *lakka* of the numeral **laSKa* "1" (#1.1.) is recognizable. Any deeper structure remains unsolved. At least a hypothetical possibility could represent a compound **laK-* "1" and Kanuri (Lukas) *karádi* "palm of hand", hence *"one [subtracted from] palms of hands" ?

The KAN numeral "9" was borrowed into some Kotoko dialects: Buduma (Koelle) *heligar* = (Decorse) *(fi)liger* = (Barth) *seliyár*, Kuri (Decorse) *seligar* (Gaudefroy-Demombynes 1907: 276).

9.2. In common TU **yissi* "9" probably appears the same root as in Zaghawa *dištii / distii*, Bideyat *dišti* "9", namely the numeral "4" attested in Zaghawa *išté*, Bideyat *éšté* and Berti *sitti*. If we accept it, the initial TU **y-* could reflect the conjunction *ye* attested in Tubu (Lukas). The regular change **yi-* < **wi-* (Lukas 1953: 9) opens a possibility to see here a reduction of the numeral "5". Hence "9" = "[5] plus 4" or "5 [+] 4". The initial *d-* in Zaghawa & Bideyat remains enigmatic as in the case of the numeral "7" (§7.3.). The formal similarity of the Zaghawa numerals "6", "7" and "9" is undoubtedly also a result of a secondary convergency. Not just an accidental parallel may be seen in Kadugli (= Talla) *uuḍumu ṭiṣṭa* "9" where *uuḍummu* = "5". But the second member differs from *iigiiso* "4". Probably a synonymous numeral "4" appears in *ṭiŋṭiṣṭa* "8" = "4+4".

9.3. The numeral "9" attested in Berti in variants *kedoesi* (Spence), cf. *makoedoesi* "90", *kadussi* (Arkell), *kiddasi*, *kadassi* (MacMichael), *kizaiti* (Holý) has no hopeful etymology within Saharan. It can represent a borrowing from any Central Sudanic source, cf. e.g. Tane *mi kidi so* "9" = "5 + 4", *mi kidi zio* "7" = "5 + 2" etc., Ngama *gridi so* "9", Tele *geden so* "9" (see Decorse apud Gaudefroy-Demombynes 1907: 230–231). The final vowel *-i* was perhaps modified after Berti *sitti* "4".

10.1. The variants of the numeral "10" in Kanuri and Kanembu dialects allow a projection in common KAN **mi[a]ogu*. Analyzing it as a compound, in the latter member KAN **(v)ogu* "5" can be identified (#5.1.). It implies the meaning "2" for the first component. This identification has no support in Saharan languages. Outside Saharan perhaps only Gumuz **mband //* Kunama *bare //* Maban **mbari* "2" and Mimi (Gaudefroy-Demombynes) *mèl* "2" can be quoted. It is interesting that in this language, classified as Maban by Greenberg and Bender, the numeral "10" *mik* suggestively resembles the KAN counterpart. Meinhof & Klingenheben have recorded a similar form in the

unclassified language Borgu: *maŋgu* "10". Similar forms appear in some Central Chadic languages (Kraft): Higi Nkafa *mùŋəy*, Higi Baza, Higi Ghye *mùŋə*, Higi Kamale *mùŋɛ*, Higi Futu *mùŋi*, Fali Gili *mùŋ* "10" (metathesis of a form of the type of Fali Kiria *gwùmù* "10" ?). Cf. also Egyptian *mḏw* "10" ?

10.2. Common TU **murdom* "10" confronting with **digidom* "20" allows to isolate the root **-dom* "10". Tuda (Nachtigal) *dútyu* and Teda (Müller) *dukkiuu* "20" represent probably an analogical compound in the opposite order, perhaps an innovation**dom-ciu* "10 x 2". Accepting the meaning "2" of **dig-* (#4.1.), it is natural to expect the meanings "one", "single", "finger" or "all" for the root **mur-*. Berti data, those of MacMichael especially, complete this reconstruction: *mus(s)a(ng)* "10" and *mussu* "20" vs. *sa(ng)* "1", and *su* "2" give a chance to isolate the root **muC-*. The identification *C* = *r* has a serious support in the numeral "100": *umur* (Arkell) = *ommar* (MacMichael) if it represents an original multiplication **mur-mur* "10 x 10". There are numerous parallels in other Nilo-Saharan languages although their relationship is not sure: Nubian **muri* > Hill Nubian **bure* "10", Gulfan *ilbúrɛ* "100", Nile Nubian **imil* and Meidob *immil* "100" < **ilmil* <**ilmuli* < **il-muri* "10 x 10" (Blažek: Nubian numerals, #10.2.) // Taman **martɔk* "10" = "10 x 1" // Central Sudanic: Lugbara *mudŕ* "10", *mɛrírì* "20" where *írì* = "2" // Kuliak: So *mɪmɪr* "10" // ? East Nilotic: Bari *mɛrɛ gɛlɛŋ* "10", i.e. "10 x 1". If we accept the relationship of these words, a common etymology should exist. There are e.g. these possibilities: (i) Bari *mɛr* "crown of head" >> "top [number]"; Spagnolo (1933: 73) sees in Bari "10" directly the word *mɛrɛ* "mountain"; (ii) Nilotic **mɔr* "finger" (Dimmendaal); (iii) Jumjum (West Nilotic) *mɔreen* "all" (Bender).

The root **-dom*, the proper bearer of the meaning "10", has the closest relative in Zaghawa *timm(í)* "10" although a borrowing of the latter form from some Nubian source cannot be excluded, cf. Birgid *tummun* (Thelwall) = *timmun* (MacMichael), Meidob *tɨmizɨ* (Thelwall) = *timmigi* (MacMichael), Haraza *timinah* (Bell) besides Nobiin *dimee*, Kenzi *dimini* & Dongola *dímin* "10". Also other parallels represent at least in some cases cultural words: Berta: Fadasi & Undu *ma-θuuma*, Gebeto *mə-duma* (Bender), Fazoglo *madoma* (Tutschek); the prefix *ma-/mə-* forms also the numerals 1–6 // Nilotic **tɔmɔn* "10" (Dimmendaal) // Surma **tommon* "10" // Koman: Fungi (MacMichael) = Jebel Gule (Seligmann) **diman* in *diman-didin* "9" = "10 -1", cf. *didian* "1". It is tempting to include here also the numeral "5" in Krongo-Kadugli: Mudo *ṭúmmu*, Yegang *dúmmṵ́*, Miri *iiḍúmmu* etc. (Schadeberg). Gaam (Bender) *tɔ́mɔ́n* = (Marno) *tamann* and Hamej (Seligmann) *tŭm* "1" open a possibility to derive this numeral from the meaning "all" attested in Nubian: Meidob (MacMichael) *tuma* // Maba *dum* // Kunama *tumma* (Greenberg 1963: 95, 117, 133) although a borrowing of the etymon "all" from Arabic is not excluded too. An alternative etymology can be based on Old Nobiin ΔΟΥΜ, Mahas *dumm* "to take, seize, catch" (Murray 1923: 40) // Nilotic: West: Dinka *dam*; East: Bari *dum-un* id. (Reinisch 1911: 163).

Similar forms for the numeral "10" are also diffused outside Nilo-Saharan macro-family, namely in Cushitic: Beja *tamin & tamun* "10" // Agaw **-täŋa* "-ty" // East Cushitic **tamman- /*tamm-* "10" > Omotic **tamm-* "10" and in Mande: Soninke *tamu*, Bozo Sorogo *tyemi*, Malinke, Vai, Kono *taŋ*, Bambara *tan* etc. "10" (Mukarovsky 1971: 143). The task to determine a primary source remains open.

10.3. Bideyat *sagoti* "10" can be perhaps connected with Berti *sang* "1".

10.4. Common KAN **fi-* forming tens has no hopeful etymology within Saharan. Is it possible to compare it with Songhai (Prost) *wey*, (Westermann) *iwéi* "10" ? Cf. e.g. Kanuri (Lukas) *fídègə* "40" vs. Songhai *wǫitaaki* "40". Similarly Fur (Beaton) *weyɛ* = (Meinhof) *wo(i)ye*, *woje* "10" can be quoted. But there are remarkable parallels even outside Nilo-Saharan: Mande: Susu *fũ*, Bandi, Loma *pu*, Loko *puu*, Mano *vũ*, Tura *bũ*, Yaure *fu*, Mwa *vu*, Samo Toma *fù* etc. "10" and Central Chadic: Gude *pu*, *puwà*, Nzangi *pu*, Gudu *pú*, Mwulyen *bù*, Bachama *bə̌w* "10" (Mukarovsky 1987: 362–363).

§6. Conclusion.

The oldest common Saharan numerals are represented by East-West isoglosses: ## 1.2., 2.2., 3.1.+3.2., 5.1., 6.2., 8.1., 9.2., 10.2. Confronting the system of all numerals in Saharan languages with numeral systems of other Nilo-Saharan languages, it is evident that the Saharan numerals are innovated, esp. those of the KAN branch which are connected by remarkable isoglosses with Songhai (## 1.3., 3.1. & 3.2, 4.1., 5.1., 10.4.). Some wide-spread Nilo-Saharan numerals can be identified at least as members of Saharan compounded numerals: ##4.1. & 6.2. **dig-* "2"; ##6.1. & 7.1.**ar-* "2"; #10.1. **mbar-* "2"; ##7.1 & 7.2. **tur-/*tud-* "5" (if it is not identical with TU **tur-* "1"). The etymological analysis of Saharan numerals gives a convincing evidence about an affiliation of the Saharan family within the Nilo-Saharan macro-family. Only few parallels represent evident borrowings, e.g. Berti "9" < Central Sudanic; on the other hand, KAN "7" > Kotoko and KAN "6", "8", "9" > Buduma & Kuri. There is also a possibility of contacts between East Saharan and Kadugli (cf. 9.2.).

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ZKS *Zeitschrift für Kolonialsprachen.*

NUBIAN NUMERALS

§1. There are more models of classification of the Nubian languages:
Thelwall 1978: 270

A. Nile Nubian:	1) Nobiin = Mahas (& Old Nobiin) & Fadojja
	2) Kenzi & Dongolawi
B. Hill (= Kordofan) Nubian:	1) Dair, Kadaru, Ghulfan, El Hugeirat
	2) Dilling, Western Kadaru, Karko, Wali
C. Birgid	
D. Meidob	
E. Haraza	

Thelwall 1983: 97

A.	a) Nile Nubian:	1) Nobiin
		2) Dongolawi
	b) Birgid / Hill Nubian:	1) Kadaru, Debri
		2) Birgid
B.	Meidob	

Bechhaus-Gerst 1984: 17 (cf. already Greenberg 1963: 85)

A. Nile Nubian	1) Nobiin
	2) Kenzi & Dongolawi
B. Hill Nubian	Dilling, Kadaru, Debri
C. Birgid	
D. Meidob	

Bechhaus-Gerst l.c. calculated the lowest percentage of common cognates for the basic lexicon (102 words) between Nobiin & Birgid: 37%, Nobiin vs. Meidob follow with 40%, Nobiin vs. Hill Nubian oscilate around 42%. She dated the beginning of the divergence to 33rd cent. BP and localized the Nubian homeland in the area of Kordofan — Dar Fur (p. 113), differing two waves of migration into the Nile Valley: (1) Nobiin (before 1000 BC); (2) Kenzi-Dongolawi (2nd cent. AD).

Recently Bechhaus-Gerst (1991: 92–93; cf. already 1984: 121) has radically changed the traditional scheme:

A. Nile Nubian:	Nobiin	
B. West / Central Nubian:	a) Central Nubian:	1) Kenzi & Dongolawi

2) Hill Nubian
3) Birgid
b) Western Nubian: Meidob

§2. Beginning from Greenberg (1963), the Nubian languages are included in the vast Nilo-Saharan macro-family. Greenberg (1963: 85) postulated the East Sudanic super-branch, consisting of 9 coordinate branches: 1. Nubian, 2. Surma, 3. Barea = Nara, 4. Ingassana = Tabi = Gaam, 5. Nyima & Affiti, 6. Temein, 7. Tama, 8. Daju, 9. Nilotic.

According to Ehret (1993: 105–106) the internal classification of Eastern Sudanic super-branch is as follows:

1) Astaboran:	a) Nara = Barea		
	b) Western Astaboran:	(i) Taman	
		(ii) Nubian	
2) Kuliak:	a) Ik		
	b) Western Kuliak:	So, Nyang'i	
3) Kir-Abbaian:	a) Jebel:	(i) Gaam; Aka etc.	
		(ii) Bertha	
	b) Kir:	(i) Nuba Mountains: Nyimang, Temein	
		(ii) Daju	
		(iii) Surma — Nilotic:	α) Surma
			β) Nilotic

Bender (1992: 15–39) proposes the different model:

A) Berta
B) Core Group: 1. a) Nubian, b) Nara, c) Nyima, d) Tama
2. a) Surma, b) Jebel, c) Temein, d) Daju, e) Nilotic
3. a) Koman, b) Gumuz
4. a) Krongo, b) Kadugli

Besides significant differences, Ehret and Bender agree about a closer relationship of Nubian and Tama languages. The comparison of systems of numerals supports this conclusion.

§3. Nubian numerals

There is no special study analyzing the Nubian numerals. Zyhlarz (1928: 114–115) collected the numerals of the first decad from 7 representative Nubian languages. Meinhof (1918–19: 99–102) has studied the Hill Nubian numerals. The Nubian numerals were confronted with the numerals of other Nilo-Saharan languages already by Reinisch (1911). Kluge's (1937) collection of the numerals of various Nilo-Saharan languages is also useful till the pres-

ent time. The first attempt to postulate the regular phonetic correspondences among Nubian languages was made by Zyhlarz (1928, 1949–50). The first version of the proto-Nubian reconstruction was presented by Bechhaus-Gerst (1984). The reconstructions of the following numerals are borrowed from her: "1", "3", "4", "5", "6", "7", "8". The author is responsible for the remaining.

P-Nubian Bechhaus-Gerst	ONobiin Browne	Nobiin Werner	Kenzi Hofmann	Dongola Armbruster	Kadaru Thelwall	Dair Junker & Czermak	Kundugr Hess	Haraza Bell	Birgid Thelwall	Meidob Thelwall
1 *bɛr	OYEP-	*wɛ̀er*	*wéer*	*wɛ́ɛr*	*bɛrɔ*	*ber*	*bɛ̨ɛr*	*faridkih*	*meelug*	*pərhi*
2 *arul	OYO(Y)-	*úwwó*	*owwi*	*óww(i)*	*ɔrro*	*ora*	*ore*	*auriyah*	*ulug*	*ɔddi*
3 *ɪɔssik	TOYCKO(Y)-	*tú/ískó*	*toski*	*tósk(i)*	*tɔjuk*	*tu̱ɗú̱*	*túge*	*tūziqih*	*tizzig*	*taasi*
4 *kemji	KEMCO-	*kémsó*	*kɛ̀mis*	*kɛ́mis*	*kemnju*	*kenu*	*kiinge*	*kinizih*	*keemzi*	*eezi*
5 *dišši	ΔIσ-	*dlj(i)*	*diğ*	*díğ*	*ticcu*	*t/dišu*	*tiše*	*tijjVh*	*tišši*	*tecci*
6 *g"arši	ΓOΛσω-	*górjó*	*gorığ*	*górığ*	*kwarcu*	*kwdršu*	*kwarše*	*kuršabah*	*korši*	*kɔrhi*
7 *k"alad	KOΛOT-	*kòlòd*	*kolod*	*kólod*	*kwaladu*	*kwaldd*	*k"oldade*	*kalūdah*	*koldi*	*ɔlɔnti*
8 *eddiu	ΙΔOYEI	*idwó*	*idu*	*ídiw*	*ɛddu*	*éddu*	*idde*	*adūwah*	*ittu*	*idii*
9		*òskòdì*	*iskóod*	*iskōd*				*askūdah*	*ijiŋoldi*	*upud*
10 *dimun	ΔIMEΔI	*dimé*	*dimin*	*dímin*	*wedu*	*'wíd*	*weede*	*timinah*	*tummun*	*timizi*
*[m]uri					*boɣe*	*buuré*	*buŋe*			
20 *arri	APPE-, AΔω-	*dróo*	*ari*	*ari*						
*tarbu					*tarbɔ*	*tarbu*	*tarbee*			
100 *immil < *il-mil ?		*imil*	*imil*	*imil*						*ímmil*

§4. Taman numerals

Tama MacMichael	Tama Edgar	Erenga MacMichael	Erenga Edgar	Sungor Lukas	Sungor Edgar	Miisiiri Edgar	Maraariit Lukas	Maraariit Edgar	Abu-Sharib Edgar
1 *kuur*	*kɔ̀r*	*kuur*	*kúr*	*kor*	*kur*	*kan*	*kárra*	*kára / kun*	*karre*
2 *warri*	*wári*	*warri*	*warri*	*wáree*	*wari*	*wurra*	*wírree*	*wári*	*werre*
3 *ishi*	*iši / ici*	*itcha*	*icà*	*ícə*	*écá*	*icca*	*ǵíte*	*íti*	*ette*
4 *kus*	*kús*	*kus*	*kús / kuz*	*kus*	*kús*	*kus / quz*	*kǫw*	*ków*	*kow*
5 *massi*	*mési*	*mussi*	*màssí*	*másii*	*másí*	*mussa*	*máai*	*máal*	*maai*
6 *toor*	*tor*	*toor*	*toř / tuř*	*tor*	*tɔr*	*toř*	*toor*	*túur*	*tur*
7 *kal*	*kàl*	*kal*	*kál*	*kal*	*kál*	*qal*	*kul*	*kul*	*kul*
8 *kimis*	*kim/nis*	*kibis*	*kibis*	*kibs*	*kíbís*	*qees*	*kákawak*	*kàkàwák*	*kakawak*
9 *uuku*	*ùkkù*	*uuku*	*úkù*	*úku*	*úkù*	*oq*	*kàrkás*	*karkás*	*karsak*
10 *merr*	*merr*	*merr*	*mer*	*mer*	*mɛ̀r*	*martik*	*tok*	*tǫk*	*tok*

§5. Comparative-etymological analysis of the Nubian numerals.

1. Within Nilo-Saharan there are no evident cognates of pNub **bɛr* "1", perhaps with the following exceptions: East Nilotic: Lotuko-Masai **-bo-*"1" (Vossen) // Kuliak: Tepes *ibe* "one, only" (Ehret) // ? Maba: Kaben *faya* "1" (Nougayrol; but cf. East Nilotic: Teso-Turkana *-péě* and Central Sudanic: Kuka *fene*, Bulala *pinne* "1" ?) // Central Sudanic: Woro *'bal(a)*, Dongo *'bal*, Kresh *'bala* (Santandrea) "1"; Meinhof's record of Kresh *gbala* "1" allows to assume an original archetype **gwala* or sim. A related root could perhaps be recognized in pNub **g^{w}arši* "6", if the analysis **g^{w}ar-dišši* "1+5" is correct (Reinisch 1911: 77). Armbruster (1960: 178), following Reinisch, speculates about a development from **gwar*. But the sequence **g^{w}a-* does not change in

pNub **ba-* (cf. Bechhaus-Gerst 1984: 32). The speculative derivation **b-* < **g^{w}-* could be valid only for a different vocalism than **a*, maybe front vocalism, hence **g^{w}Er* > **gbɛr* > **bɛr* ? The hypothetical protoform **gwEr* is compatible with the Taman counterpart reconstructible in the form **kwar*, although this phonetic correpondence cannot be supported by other parallels.

2. The reconstruction **auri* "2" follows Armbruster (1960: 178), postulating **awr-* (cf. Dongola *áauwi* after Meinhof and esp. Haraza *auriyah* after Bell vs. *awude* after Newbold), while Reinisch (1911: 78) proposed **arw-*. The change **-r-* > *-w-* is regular in Nobiin (Bechhaus-Gerst 1989: 93–94), while the same change in Kenzi-Dongola represents probably an influence of Nobiin. The closest cognates appear in Taman **warri* "2" and probably Nyima *warba* "2" (Meinhof). The other parallels appear in Fur *awu* (Beaton), *a(w)u*, *weu* etc. (Meinhof) "2" // Nilotic **aRyɛw* "2" (Dimmendaal) // Central Sudanic: Moru-Maŋgbetu **(a)riyu* "2" (Bender) // Nara *arriga* "2" & *jariga* "7" (Thompson) // ? Bertat *ari* "7" (Marno) // Krongo-Kadugli: Mudo *kaará*, Yegang *aríya*, Kufo *(nd)ɛ́ɛ́rá*, Miri, Talla, Tolibi *ɛ́ɛ́ra*, Sangali *ɛ́ɛ́ré*, Krongo *yáária*, Talasa *ɛ́ɛ́rya* "2" (Schadeberg).

Taking into account Nile Nubian **arri* "20" and the external cognates, the reconstruction **arui* "2" seems to be preferable.

3. PNub **tɔssik* "3" was compared with Nilotic **däk* "3" (Dimmendaal), cf. Reinisch 1911: 168; Murray 1923: 169. Bender (1981: 256, 261) postulates the Nilo-Saharan "prototype" **(ko-) tVs-(ig)* "3". Among his examples, the most suggestive seem to be the parallels from Koman: Kwama *twasan*, Opo *tušušl/s* "3". But their dental anlaut represents very probably a prefix, determining also other numerals (cf. Bender 1983: 272, 274, 276). The other parallels quoted by Bender are also rather problematic: Kanuri *yáskə*, Fur *iis*, Songhai *za*, pDaju **kodos* (Thelwall), Tama *tši/ici*, Maraariit *ítì*, Jebel: Aka *éedé* etc. But there is a promising internal etymology based on Meidob (MacMichael) *tŏser-uusi* "middle finger" (*uusi* "hand") and *tŏser-otti* "first toe" (*otti* "foot"). This rather strange semantic difference follows probably from the original meaning **"protruding (finger)", hence "middle finger" but "first toe"; cf. also Old Nubian TOYCKO(Y)- "3" vs. TOYCKANTE– "πρῶτος", the first" (Browne 1989: 21). Let us mention that Brugmann (1892: 464) saw in the Indo-European numeral **ter-*, **tri-* "3" an original denotation of the "middle finger", deriving it from the root **ter-* attested in Greek τέρθρον "Ende, Spitze", Old Indic *tár-man-* "Spitze des Opferpfostens".

A hypothetical cognate to the Nilotic **däk* "3" could be Meidob **teka* used in *urpii-n deka* "third finger, middle toe" (MacMichael) where the first component corresponds probably to *orbidi* "arm" (Murray 1923: 139). In principle, it is possible to imagine a metathesis from pNub **tɔkiss* (cf. Dair *oši* "finger", *oššu* "arm" by Munzinger; Gulfan *osie* "finger" by Russegger, Dilling *iišii* "hands" — see Meinhof 1918–19: 180–81), supported also by

isolated Karko *tǫkisɛ́*, *túkisɛ́* "8" (see #9). This new analysis permits to compare the root **tɔk-* with Nilotic **däk*.

4. PNub **kemji* "4" has the closest cognate in the Taman numeral "8": Tama *kimis / kinis*, Erenga *kibis*, Sungor *kíbís* and probably Miisiiri *qees*. Here Edgar (1991: 122) assumes a similar internal structure as in Maraariit *kàkàwàk*, Abu-Shaarib *kakawak* "8" < **kow-kow-ak* *"4+4+pl.". But the connection of pTaman **kimis / *kibis* "8" and **kus* "4" is not so evident. Perhaps a more plausible solution is to presume that there was a borrowing Nubian "4" >> Tama "8". There are probably no external parallels, perhaps with the exceptions of "Mimi" (Nachtigal) *kíndoi* "4" and Nyima (Meinhof) *kudu* "4". "Daju of Dar Fur" (MacMichael) *kashfei* "4" could also be taken into account. On the other hand, a pure Nubian etymology cannot be excluded. The reconstruction of the numeral can be modified into **kemńji* or **kemńsi* (cf. Kadaru *kemɲju*). This alternative reconstruction allows to speculate about still older **kVń-mVsi*, a hypothetical compound where the first component corresponds with Kenzi-Dongola *kińa*, *kína* "small, little, less", and the second one with pTama **massi* "5", hence "4" = *"a small five". A similar semantic motivation can probably be assumed for the Anatolian numeral **meyu-* "4", differing from the form **k^{w}etwōr* common for the other branches. Heubeck (Sprache 9[1963]: 201f) derives it from the Indo-European root **mei-* "mindern", cf. Tocharian B *maiwe* "small, young" etc.

5. PNub *dišši* "5" was compared with West Nilotic: Dinka-Nuer (Reh)**dhyec* "5" (Reinisch 1911: 162; Murray 1923: 85). Greenberg (1963: 100) added South Burun *doi(k)* "5" and Daju **-da(k)* / **-di(k)* and Nara *da-/ja-*, determining the higher numerals. These examples must be analyzed in detail. The real form in South Burun should be *dŏi*, while *doi(k)* is in Jumjum. The closest relatives appear in Mughaya *adǫ̨ic*, Kurmuk *nŭ-doos*, Ulu *kŏ-doos* (Evans-Pritchard 1932: 29, 38). Thelwall (1981: 182–83) has reconstructed the Daju numerals as follows: **nuxu* "1", **pidax* "2", **kodos* "3", **tispet* "4", **madək* "5", **aran* "6", **paɣtindi* "7", **kosande* "8", **tabistanda* "9", **asiń* "10". It is evident that the numerals "7–9" (and perhaps also "6" if **aran* < **aranda* or sim.) are extended by the component **-indi*, **-ande*, **-anda* which is undoubtedly identical with pDaju **ande* "arm, hand" (Thelwall 1981: 175; Greenberg 1963: 101, 117 compares it with Afitti *aaṭa* // Nara *ad* // Surma: Didinga, Murle etc. *adhit* // Nobiin *eddi* // Central Sudanic: Mangbutu *adi*, Mamvu *edi* etc. "hand", cf. also West Nilotic: Ulu *intu*, South Burun *ĭntu*, Jumjum *ĭnti* after Evans-Pritchard). The *-k* termination appears only in the old records of Sila (= "Dagu of Sula") of MacMichael (1920: 198): *faktindik* "7", *kohandak* "8", *bistandak* "9" besides *biddak* "2", *tishek* "4"; it is very probably a suffix. The numeral **madək* "5" can also be segmented in **mad-* & *-ək* in agreement with the external cognates: Nilotic **m[ue]t* > South Nilotic **muut* (Rottland), East Nilotic: Lotuxo-Masai **-miet-* (Vossen) "5" // Koman

(Bender): Twampa *múudèd*, Opo *muta-kwei*, Fungi (MacMichael) *du-budi* "5" vs. Twampa *mèδ*, Kwama *mbiit*, *miit*, *bɛt'*, Opo *bit- / -mit'* "hand" // Central Sudanic: Ngama, Tele, Barma, Sara, Mbai *mi*, Kenga *mii*, Bongo, Kuka *mui* "5", and perhaps Fur: Mimi (Jungraithmayr) *wɔ́t* // Nara (Thompson) *wiita* "5". Reh (1985) has reconstructed two forms for "5" in West Nilotic: Dinka-Nuer **dhyec* and Lwoo **a-bic*, which appear to be quite unrelated. But Rüppell (1829) had recorded yet an initial cluster *vd-*; similarly Mitterrutzner (1866) *wd-*: *vdiéc* : *wdyec* (modern *dhyec*) "5", *vdetèm* : *wdetem* (*detem*) "6", *vderòu* : *wderóu* (*dhorou*) "7", *vdenguàn* : *wdenguan* (*dhonguan*) "9". Accepting the change *vd-* < **bdh-*, the Dinka-Nuer and Lwoo forms are derivable from West Nilotic **bdhyec* or still older **bdhyek* (cf. Jumjum *doik*). The confrontation with West Nilotic **bthyaar* "10" (> Dinka *thyaar*, older *vtiar* = *wtyar*, Juur *apaar*, Lwoo *apar / piero*, Shilluk *pyar* etc.) allows the following conclusion: the analysis **bthyaar* "10" = "5 x 2" (cf. *ariou* "2") implies that **bdhyek* "5" = "5 x 1". The common root with the meaning "5" could have been inspired by the word for "hand", cf. Lwoo *bat*, pl. *bede* "arm", Acholi *baàt / baàd* id., Jo-p-Adhola *bat* "arm, hand", Dho-Alur *bàt* "arm, thigh" etc. The second component in **bdhyek* can be identified with Dinka (Nebel) *tok*, Lango (Conti Rossini) *dek* "1" or with West Nilotic (Reh) **kɛ̀l* "1".

If the preceding suggestions are correct, a direct comparison of pNub **dišši* and West Nilotic **bdhyek* "5" is problematic. But the reconstruction **dišši* can reflect the older form **diK(V)ši* in agreement with the laws of historical phonology of the Nubian languages. This hypothetical protoform is analyzable as a compound consisting of two components: **diK-* corresponds to Nara (Reinisch) *toko / doko*, (Thompson) *dokku* "1" // West Nilotic: Dinka *tok*, Lango *dek* (Conti Rossini); ? East Nilotic: Bari *tɔ* "1" // Kuliak: Nyang'i (Fleming) *-odok / -dok*, (Ehret) *nardok* "1" // ? Berta: Mayu (Triulzi et al.) *d'uk'unu*, Bertat (Marno) *dogoni*, Dul (Evans & Prichard) *duguni*, Qamamyl (Cailliand) *mu-duku* "1" // Maban: Maba (Barth, Nougayrol) *tek*, (Edgar) *tɔ́ɔ*, Kodoi (Gaudefroy-Demombynes) *tek*, Aiki (Edgar) *tùwá* "1" // Fur *tɔk* "1" but *dik* when objects are counted one by one (Beaton 1968: 57) = (Meinhof) *tok & di(i)g*, Mimi (Gaudefroy-Demombynes) *deg* "1"; cf. also Taman (Edgar): Miisiiri *martik* "10" vs. Tama *merr* "10" and Maraariit *tok* "10" (sic), hence Miisiiri *mar-tik* = "10 x 1". The second component can be identified with one of the Nubian words for "hand": Meidob (MacMichael) *usi* "hand"; Hill Nubian: Kundugr *oše*, Dair (Junker & Czermak) *ošt*, (Munzinger) *oši* "finger" vs. *oššu* "arm", Kargo *osi*, Dilling *iišii* (pl.) "hand, arm", Gulfan *osie* "finger" = Kundugr *ošũ* id. (Meinhof 1918–19: 180–181; Murray 1923: 141 adds Tabi = Gaam *oos* "hand"). Cf. also Fur (Meinhof) *os*, (Beaton) *ɔz* "5". To conclude, it is admissible to derive **dišši* from **diK- & *uši* "one hand". Let us mention that in Haraza Newbold recorded *tijjidi*, while Bell *tijjVh* and *tiggida* (Bell 1975: 11).

6. PNub **gʷarši* "6" was derived from **gʷar-dišši* "1+5" (Reinisch 1911: 77; Armbruster 1960: 178). Rather puzzling are Haraza forms: *kuršaba* (Bell

1975: 12 offers the emendation */koršayal/* or *kurtaba* (Newbold). The hypothetical identification of **gʷar-* and **bɛr* "1" is discussed above (#1). Within Nilo-Saharan languages the most promising parallels to **gʷar-* appear in pTaman **kwar* "1" // Central Sudanic: Kresh (Meinhof) *gbala* = (Santandrea) *'bala* "1" if it reflects an older **gwala* or sim. // ? East Nilotic: Bari (Spagnolo) *gɛlɛŋ* "1", *gɛlɛrɛ́* "once".

But there is yet another alternative etymology. Assuming the development **gʷarši* < **gur[a]-uši*, it is possible to identify the first component with Meidob (MacMichael) *kur-ko* "thumb", and the second one with Meidob *usi*, Dair *oši* etc. (see #5) "hand, arm", hence *"thumb" & "hand" = "6". Zyhlarz (1928: 103) compared the Meidob *kurko* with Zaghawa *gurrgo*, pl. *gurrbo* id., later (1949–50: 19) he connected it with Meidob *koore* "big", deriving them from pNub **ŋɔr* "big" (Bechhaus-Gerst 1984: 59).

7. PNub **kʷaladi* "7" (Haraza *kalūdah* allows to modify the reconstruction in **kaludi*) can be compared with the Taman (Edgar): Tama *kàl*, Erenga, Sungor *kál*, Miisiiri *qal* vs. Maraariit, Abu-Shaarib *kul* "7" and Fur: Mimi (Jungraithmayr) *úkêl* "7". Nyima (Meinhof) *kwalad* "7" is an evident borrowing from Hill Nubian. In spite of these striking parallels the etymology remains unsolved. Meidob *kulkerti* "first finger" = "forefinger" = "second finger [of the second] hand" > "7" cannot be taken into account directly because Meidob *k-* < pNub **g-*.

In case of an absence of any convincing internal etymology it is quite legitimate to ask whether the numeral is not borrowed from a neighboring language with the transparent etymology. A hypothetical source could be found in the Krongo-Kadugli language family (Schadeberg, proving its affiliation in Nilo-Saharan, uses the term "Kadu"): Mudo (= Tulishi by Stevensen) *kɔ́rdáta* "7". Confronting it with the following numerals *áttá* "8", *kɔ́rdɔ́bá* "9", *ʈɔ́bbá* "10", it is tempting to interpret "7" = "8 minus (1)", "9" = "10 minus (1)". The substitution *-rd-* > *-l-* looks quite plausibly. A closely corresponding structure appears e.g. in the Central Sudanic language Kussuvulu (Bruel): *kadasoso* "7", *soso* "8", *kalbu* "9", *bu* "10". The borrowing hypothesis supports the localization of the Nubian homeland in Kordofan (Nuba Mountains ?).

8.1. PNub **eddiu* "8" was analyzed as *"hand (without thumbs)-two" already by Lepsius (1880: 48), cf. Nobiin *èddì* "hand" & *úwwó* "2" (cf. Werner 1987: 109). But this solution probably excludes the usually accepted relationship of Nobiin "hand" and Hill Nubian: Dilling *únti*, Koldegi *ondu* "arm", Gulfan *onto* "hand" (Meinhof 1918–19: 169). A rather strange form was recorded by Russeger in Gulfan *ebdo* "8" (see Meinhof 1918–19: 168). It reflects perhaps **ewdo* < **edwo*. Nyima (Meinhof) *edo* "8" is borrowed from some Hill Nubian dialect.

There is at least a hypothetical alternative possibility to isolate the root **ed...* "3" here, based on an external comparison with various Nilo-Saharan

languages: Taman (Edgar): Maraariit *ítě*, Abu-Shaarib *ette* vs. Miisiiri *icca*, Tama *ici* / *íšî* "3" // Fur: Mimi (Jungraithmayr) *ít*, Fur (Beaton) *iis* // Jebel: Aka *éedé*, Silak *eede*, Tornasi *ede*, Malkan *odo* etc.; Gaam (Marno) *oda*, Hamej (Meinhof) *ŏda* "3" etc.

8.2. Meinhof (1918–19: 100, 168) analyzed the isolated Karko *tǫkisɛ́*, *túkisɛ́* "8" as "3+5" (cf. *ǫǫ́sɛ́* "hand" ?). If we allow for the possibility of metathesis, the numeral resembles the proto-language **tɔssik* more than Karko *tǫdjɛ́* "3". More about the etymology — see #3.

9.1. Bechhaus-Gerst (1984: 76) derives Nobiin *òskòdi* and Kenzi-Dongola *iskood* from proto-Nile Nubian **iskodi* "9". Also Haraza *askūdah* (Bell) must be added. Meidob *ukuddi* (MacMichael) = *úkkúdí* (Thelwall 1983: 99) can be related too.

The internal etymology remains puzzling. Among possible external parallels, the Taman examples must be quoted: Tama *ukku*, Erenga, Sungor *úkù*, Miisiiri *oq* "9". Maraariit *kàrkás*, Abu-Shaarib *karsak* "9" = "one subtracted from [ten]", imply that **-ku* can be identified with Tama *kùr*, Erenga *kúr*, Sungor *kur* "1".

9.2. Thelwall (1978: 278) quotes Meidob *upudi* "9" (it is remarkable in confrontation with his later record *úkkúdi*), similarly *úfúdí* after Bell (1975: 15). This form is compatible with Birgid (MacMichael) *ijmoldi* = (Thelwall) *ijiŋoldi* "9". Meidob *p* and Birgid *m* correspond regularly, reflecting pNub **b*, cf. **bɛr* "1" > Meidob (MacMichael) *pirrki* = (Thelwall) *parhi / parci*, Birgid (MacMichael) *meirti* = (Thelwall) *meelug*. The change **-rT-* > *-d-* is regular in Meidob, cf. Meidob *ufudi*, *upudi* "ashes" vs. Birgid *uburti*, Nobiin *oburti*, Kenzi-Dongola *uburti*, Dilling *opte* < pNub **opurti* (Bechhaus-Gerst 1984: 53–54) or Meidob *kada-ŋi* "tongue" vs. Birgid *natti*, Nobiin *narr*, Kenzi-Dongola *nɛd*, Dair *jaldo*, Haraza *doldo* < pNub **jardi* (Bechhaus-Gerst 1984: 72). It means that the original form of the numeral "9" may be derived from **-bVr-di*, where the root **-bVr-* can be identified with pNub **bɛr* "1". It remains to explain the first syllable of the numeral. The following hypothetical solution offers a common etymology for both forms of the numeral "9" discussed in ## 9.1 & 9.2. If the beginning component was derived from the verb attested in Kenzi *usuk* "to sit", caus. Mahas *isk-ir* "to put, place", Old Nobiin OYCKOYP, Kenzi-Dongola *usk-ir* (Murray 1923: 76, 181), the internal structure of the numeral can be reconstructed as **usik-bɛr-di* *"put one [from ten?]". The final **-di* agrees with the frequent nominal suffix (Meinhof 1918–19: 94). Bell (1975: 15) speculates on the regular correspondence *sk//f* among Nubian languages.

9.3. In Hill Nubian, the reconstruction *[*u*]*weed*(*-du*) / *[*u*]*weid*(*-du*) is only approximate. The diphthong is also preserved in Dulman *wǫ́idɛ́*, Dair *weeid*, *wẹd*. There Meinhof (1918–19: 94) isolated the nominal suffix *-du* here. It would also be tempting to identify in this form the same structure as in the preceding numerals (## 9.1, 9.2). But in Hill Nubian the regular reflex of

pNub **b* is *b*. The eventual change **b* > **w* could be caused by some unspecified combinatorical conditions but without any concrete proof it remains only a speculation.

An alternative solution can be based on Mahas *wiid*, Kenzi-Dongola *wíde* "to return", adv. "back, again" (Murray 1923: 186). In this case the semantic motivation could be *"[one] back", perhaps similarly as in the case of Egyptian *psḏ* "9" vs. *psḏ* "back" (Wb. I: 558, 556).

10.1. PNub **dimun* "10" continues in Old Nobiin ΔIMEΔI– (Browne), Nobiin *dímé* (Werner) = *dimee* (Thelwall), cf. Mahas *dime(C)* & *dimer(V)* (Lepsius), Kenzi *dimini* (Thelwall) = *dimin* (Hofmann), Dongola *dímin* (Armbruster), Meidob *timmigi* (MacMichael) = *tịmizị* (Thelwall), Birgid *timmun* (MacMichael) = *tummun* (Thelwall), Haraza *timinah* (Bell). Similar forms are very wide-spread within Nilo-Saharan: Nilotic **tɔmɔn* (Dimmendaal) // pSurma **tommon* // Kuliak: Ik *tomịna* // Berta: Fadashi & Mayu (Triulzi et al.) *ma-ðuuma*, Fazoglo (Tutschek) *ma-doma* // Saharan: Zaghawa *timm(i)* (MacMichael); Tubu Kashirda (Lukas) *múrdɔm* "10" vs. *dígidəm* "20" // Koman: Fungi (MacMichael) = Jebel Gule (Seligmann) **diman* in *diman-didin* "9" = "10–1", cf. *didian* "1". It is tempting to include here also Krongo-Kadugli "5": Mudo *t̪úmmu*, Yegang *dúmmṵ́*, Miri *iid̪úmmu*, Talla *uud̪ummu*, Tolibi *eed̪úmmú*, Sangali *iid̪úmmú* (Schadeberg). Gaam (Bender) *tɔ́mɔ́n* = (Marno) *tamann* and Hamej (Seligmann) *tŭm* "1" open the possibility to derive this numeral from the original meaning "all", attested in Nubian: Meidob (MacMichael) *tuma* // Maba *dum* // Kunama *tumma* (Greenberg 1963: 95, 117, 133). On the other hand, a borrowing from Arabic is not excluded too.

There is another alternative solution connecting the numeral "10" with Old Nobiin ΔOYM, Mahas *dumm* "to take, seize, catch" (Murray 1923: 40). Reinisch (1911: 163) compared it with Nilotic: (West) Dinka *dam* and (East) Bari *dum-un* id.

This form of the numeral "10" represents apparently an areal word diffused thanks to cultural contacts. Similar forms appear also outside the borders of the Nilo-Saharan macro-family, e.g. in Mande (Niger-Congo): Soninke *tamu*, Bozo Sorogo *tyemi*, Malinke, Vai, Kono *taŋ*, Bambara *tan* etc. "10" (Mukarovsky 1971: 143). No fewer suggestive parallels appear in Cushitic: Beja *tamin & tamun* "10" // pAgaw **-täŋa* "-ty" // East Cushitic **tamman-* / **tamn-* "10" > Omotic **tamm-*. The primary source remains to be determined.

10.2. The initial **b-* in Hill Nubian **bure* "10" can reflect pNub **m-*, cf. Hill Nubian **beli* vs. Nile Nubian **milli* and Birgid *mattana* "bad" < **maldi* (Bechhaus-Gerst 1984: 33, 67). An indirect support can be found in the numeral "100": Nobiin *imil*, Kenzi-Dongola *imil* (Bechhaus-Gerst 1984: 74), Meidob *immil* (MacMichael) = *ímmil* (Thelwall) vs. Hill Nubian: Gulfan (Klingenheben) *ilbúrḛ* (Meinhof 1918–19: 102, 183). The last form has a transparent internal structure **il & búrḛ* "10 x 10", cf. Dair (Junker & Czer-

mak) *il toďuŋ* "30", *il kińu* "40", *il tiśu* "50" (but Gulfan after Meinhof: *iil-ǫǫra* "40", *iil-ǫǫra buré* "50", *il-tǫdjun* "60" !). The Gulfan form *il-búrɛ* allows to analyze also the Nile Nubian & Meidob **immil* < **il-mil* < **il-mur*(-). The hypothetical pNub **muri* can be supported by the external comparison: Taman **martɔk* "10" = "10 x 1" // East Nilotic: Bari *mɛrɛ gɛlɛŋ* "10" (Spagnolo 1933: 73 interprets it as "one mountain"!), *mɛrya puök* "100" = "10 x 10"// ? Kuliak: So (Carlin) *mɪmɪr* "10" // Saharan: Tubu (Nachtigal) *múro* "10", Tubu Kashirda (Lukas) *múrdɔm* "10" vs. *dígidəm* "20" // Central Sudanic: Lugbara (Tucker) *mudŕ* "10" vs. *mɛrûrì* "20" (*íri* "2") etc. If the preceding words are related (cf. Greenberg 1963: 106), a common etymology must exist. Besides Spagnolo's interpretation of Bari *mɛrɛ* "mountain" there are other semantically more promising possibilities: (i) Bari *mɛr* "crown of head" > > "top [number]"?; (ii) Bari *mɔrɪn* "fingers" // South Nilotic **mɔɔrɪn* "finger" < Nilotic **mɔr* (Dimmendaal); (iii) Jumjum (West Nilotic) *mɔreen* "all" (Bender).

The puzzling form of Hill Nubian **tarbu* "20" can perhaps be derived from **ta-bur-* < **bur-ta-bur-* "10+10"; the conjunction **ta* is attested in corresponding Nile Nubian **da* "and", cf. Kenzi *dímin da weerum* = Dongola *dímin do weerun* "11" (Reinisch), Old Nobiin ΔΕ and possibly Meidob (MacMichael) *toor*, cf. *šedded toor uddi* "22" = "20 + 2".

10.3. Dongola *ir* forming tens, e.g. *ir toski-gi* "30", *ir kemis-ki* "40"....., *ir eskood-ki* "90" (Lepsius 1880: 49, 334), can perhaps be derived from the verb attested in Kenzi-Dongola *ir-* "to count", cf. *írar* "number" (Reinisch). A relationship with Gulfan *il*, forming probably also tens or twenties, is quite plausible. A suggestive external cognate appears in Kuliak: So *ir-kon in iyon* "30" : *iyon* "3", *ir-kon in nowa* "40" : *nowa* "4" (Carlin 1993: 109–110).

An alternative but semantically less hopeful possibility is represented by Dongola *irii* "people", pl. of *id* "person" (Lepsius). A formal parallel can be found in Surma: Mursi (Turton & Bender) *hir kón* "20", Bodi *hir kun-ko*, Tirma (Haberland) *ir kun* "20" = "man-one".

Murray (1923: 74) connected *ir & il* with Meidob *sel* forming teens, cf. *seldási* "13", ..., *selukoddi* "19" (MacMichael). The same root appears perhaps also in Meidob *šeddedi* "20", if the analysis **sel* "10" *&. əddi* "2" is correct. The etymology of *sel* remains open, perhaps Mimi (Nachtigal) *sáya* "10" or Central Sudanic: Kresh *sála*, Woro, Dongo *saal* "5" (Santandrea) could be taken into account.

§6. Conclusion.

Confronting the system of Nubian numerals with other numeral systems of Nilo-Saharan languages, it is evident that the Nubian system is innovated. Within Nilo-Saharan there are wide-spread cognates only to the numerals "2", ?? "3" and "10" (but here the areal diffusion could also play its role). In agreement with the present state of art of the genetic classification of Nilo-Saharan languages, the closest numeral system appears in Taman ("2", "4" //

"8", "7"," 9", "10", maybe also Taman "1" vs. Nubian "6" and Taman "5" vs. Nubian "4").

Abbreviations: Nub Nubian, P Proto-.

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EGYPTIAN NUMERALS

§1. Basic data concerning Egyptian cardinals including the most recent attempts of their vocalization are concentrated in the Table 1:

	Egyptian (Wb.)	Coptic	Vycichl (DELC)	Loprieno 1995: 71	Schenkel 1990: 54
1 m f	*wʃjw* (1: 273–276) *wʃjt*	S ⲟⲩⲁ, AF ⲟⲩⲉ S ⲟⲩⲉⲓ(ⲉ)	**wiʃyaw* (229, 518) **wiʃi.t*	** 'wuʃʃuw*	**wúʃʃuw* **wuʃʃúwˇt*
2 m f	*snwj* (4: 148) *snṯj*	S ⲥⲛⲁⲩ S ⲥⲛⲧⲉ B ⲥⲛⲟⲩϯ	**siny-ū-āy* (192) **sín.i.t-āy* **sinya.t-āy*	**siˈnuwwaj*	**śinéwwˇj* **śínˇj, *śinátˇj*
3 m f	*ḫmt(w)* (3: 283) *ḫmtt*	S ϣⲟⲙⲛⲧ, A ϩⲁⲙⲧ S ϣⲟⲙⲧⲉ, A ϩⲁⲙⲧⲉ	**ḫamtaw* (264) **ḫamta.t*	**'χamtaw*	**ḫámtˇw* **ḫámtˇt*
4 m f	*fdw* (1: 582) *fdt*	S ϥⲧⲟⲟⲩ, A ϥⲧⲁⲩ S ϥⲧⲟ(ⲉ), A ϥⲧⲟⲉ	**ifdaw* (281, 518) **ifda .t*	**jif 'daw*	** jˇ fṯáw* ** jˇ fṯát*
5 m f	*djw* (5: 420) *djt*	S ϯⲟⲩ S ϯⲉ	**dīwey* (223, 519, **diwi.t* 424)	**'di:jaw*	**ṭ íīˇw* **ṭ íīˇt*
6 m f	*sjsw* (4: 200) *sjst*	S ⲥⲟⲟⲩ, AF ⲥⲁⲩ SA ⲥⲟⲉ, A ⲥⲱⲉ, S ⲥⲁ	**siĭsáw* (200)	**'saʔsaw*	**śˇrśáw > *śˇ ĭśáw* **śˇrśát > *śˇĭśát*
7 m f	*sfḫw* (4: 115) *sfḫt*	S ⲥⲁϣϥ, A ⲥⲁϩϥ S ⲥⲁϣϣⲉ, A ⲥⲁϩϥⲉ	**safḫaw* (203) **safḫa.t*	**'safχaw*	**śáfḫˇw* **śáfḫˇt*
8 m f	*ḫmnw* (3: 264) *ḫmnt*	S ϣⲙⲟⲩⲛ, A ϩⲙⲟⲩⲛ B ϣⲙⲏⲛ S ϣⲙⲟⲩⲛⲉ, B ϣⲙⲏⲛⲓ	(264)	**χa'ma:naw ⁰u:naw* (1986: 1308)	**ḫamắnˇw* **ḫamắnˇtt*
9 m f	*psḏw* (1: 588) *psḏt*	SB ψⲓⲧ, S ψⲓⲥ S ψⲓⲧⲉ & ψⲓⲥⲉ	(248)	**pi 'si:jaw*	**piśíçˇw* **piśíçˇt*
10 m f	*mḏw* (2: 184) *mḏt*	SB ⲙⲏⲧ S ⲙⲏⲧⲉ, B ⲙⲏϯ	**mṓḏaw* (124) **mṓḏa.t*	**'mu:jaw*	**mṹçˇw* **mṹçˇt*
20 m f	**ḏwtj* (5: 552)	S ϫⲟⲩⲱⲧ, B ϫⲱⲧ S ϫⲟ(ⲩⲟ)ⲩⲱⲧⲉ	(333)	**ja'wa:taj*	
30	*mʃb3* (2: 47)	S ⲙⲁⲁⲃ, B ⲙⲁⲡ	(108)	**'maʃbVR*	
40		SB ϩⲙⲉ	(299)	**ḫV 'mew*	
50		S ⲧⲁ(ⲉ)ⲓⲟⲩ, B⁰ ⲧⲉⲃⲓ	** -ỉy-ū* (223)	**'dijjaw*	
60		SB ⲥⲉ	**si3sí.t* (182)	**saʔ'sew*	
70		ϣϫⲉ		**saf 'χew*	
80		S ϩⲙⲉⲛⲉ, B ϩⲁⲙⲛⲉ	**ḫamānіya.tu* (301)	**χam'new*	
90		S ⲡⲥⲧⲁⲓⲟⲩ B ⲡⲓⲥⲧⲉⲟⲩ	(248)	**pis'ɟ ijjaw*	
10^2	**š(n)t* (4: 398, 497)	SB ϣⲉ, F ϣⲏ	(254)	**ši(nju)t*	

	Egyptian (Wb.)	Coptic	Vycichl (DELC)	Loprieno 1995: 71	Schenkel 1990: 54
	*š(n).tj "200"	SB ϣⲛⲧ		*šinju:taj	
10^3	ḫ3 (3: 219–20)	SB ϣⲟ, A ϩⲟ, F ϣⲁ	*ḫa3 (255)	*χaR	
10^4	dbš (5: 565–66)	S ⲧⲃⲁ, F ⲉⲃⲁ	(210)	*ɟ v'baš	
10^5	ḥfn (3: 74)				
10^6	ḥḥ (3: 152–53)	S ϩⲁϩ "multitude"	(320)	*ḥaḥ	

§2. Any correct comparative-etymological analysis is unthinkable without knowledge of regular phonetic correspondences. The traditional system of the most hopeful responses among consonants of (some) Afroasiatic branches or languages is compiled in the **Table 2**:

Afroasiatic *	Semitic *	Egyptian	Berber *	Beja	Agaw *	East Cushitic *	Dahalo
b	b	b	b/ḇ	b / -w-	b (~ f)	b	ɓ- / -b-
p	p	p	f	f	f	f	f
ṗ ?	p / b	p or f ?	f			b or ḅ ?	
f ?	p	f	f	f	f	f	
d	d	d	d	d (~ t ?)	d	d	ɗ- / -d-
t	t	t	t	t	t	t	t
ṯ	ṯ	d / t	ḏ /,-ff	ḏ	d	ḏ	ṯ
ʒ	ḏ	z / d	z / d	d /-y-	ʒ	z	ʒ́
č	ṯ	s	s	s	s	s	ts ?
č̣	ṯ	ḏ	ẓ / ḍ	ḍ	c	ç	ṯ
ʒ	z	z	z	d /-y-	z	z	d
c	s	s	z or s- ?	s	s	s	
ç	ṣ	ḏ	ẓ	ḍ	c	ç	ç
ć	ś	š	z	š	s	š	
ć̣	ṣ́	ḏ	ẓ / ḍ	ḍ	c	ç	
s	š	s	s (~ š)	s	s	š	s
š ?	š ?	s	s (~ š)	s (~ h)	s	š	s
ṣ	ṣ	š	s (~ š)	š		š	
g	g	g / ḏ [i/u]	g	g (~ k ?)	g (~ k)	g	g
k	k	k / ṯ [i/u]	k	k	k (~ x)	k	k
ḳ	ḳ	ḳ	γ / -qq-	k	k / q ?	ḳ	ḳ
γ	ġ	ʕ	h_2-			ʕ	
ḥ	ḥ	ḥ (> ḫ)		h		h	
ʕ	ʕ	ʕ	H- / -y-	ʔ	ʔ- / -Ø-	ʕ	ʕ
ḫ	ḫ	ḫ (> ẖ)	H- / -y-	h	ʔ- / -Ø-	ḫ	ḫ
h	h	h	h_1 / h_2	h	ʔ- / -Ø-	h	h
ʔ	ʔ	3/ i/ Ø	ʔ	Ø / y- ?	ʔ- / -Ø-	ʔ	ʔ
y	y	y / i	y / i /	y	y	y	j
w	w	w / y ? / i	w / u /	w / -f-	w	w	w
m	m	m	m	m	m / ŋ	m	m
n	n	n	n	n	n	n	n
l	l	n / nr / r/3/ i	l	l	l- / -rC-	l	l
r	r	r / 3 / i/ [ʕ]	r	r	r	r	r

§3. An alternative interpretation of Afroasiatic (Egyptian — Semitic) comparative — historical phonology as proposed by Rössler (1971) on the basis of incompatibility, appears in **Table 3**:

Egyptian	*3*	*ỉ*	*ʕ*	*w*	*b*	*p*	*f*	*m*	*n*	*r*	*h*	*ḥ*	*ḫ*	*ẖ*	*z*	*s*	*š*	*ḳ*	*k*	*g*	*t*	*ṯ*	*d*	*ḏ*
Semitic	*r* *l*	*ʔ* *y* *l* *g* *ġ*	*d* *ḏ* *z* *ḍ*	*w*	*b* *p*	*p*	*b*	*m*	*n* *l*	*l*	*h*	*ḥ* *ʕ*	*ġ* *ʕ*	*ḫ* *ḥ*	*ṯ* *s*	*ś* *š*	*ḫ* *ḥ*	*q*	*k*	*g*	*t*	*k*	*ṯ* *ṯ* *ṣ* *ḍ*	*q* *ġ* *ʕ*

Quoted after Satzinger 1996.

§4. Comparative — etymological analysis

1. Eg (OK) *wʕjw* m. & *wʕjt* f. "1" (Edel 1955/64: 167), together with the verb *wʕy* "to be alone" and the noun *wʕʕw* "Alleinsein" (Wb. 1: 277) = **waʕʕʔaw* (DELC 229), reflect the root **w-ʕ-y*.

a) Hopeful cognates appear probably in Guanche (Tenerife ?) *been, veen* < **wayn* (Militarev p.c.; Woelfel 1954: 21–22 reconstructs **ven*) and in the Berber counterparts: (W) Zenaga *iwn* m. [*yiwn, yun* ?], *čwəθ* f. < **t-iwəθ*, (N) Tamazight *iğğən* < **iyyən* < **yiyən* < **yiwən*, representing pBe **yīw-an, -at*, besides (E) Augila *iwîn* < **iwân*, Ghadames *yōn* m./ *yōt* f., Siwa *əğən / əğət*, Nefusi *uğun* [= **əğğun* ?] < **əyyun* < **əyyan* < **(y)iyan*, (N) Kabyle *yiwən / yiwəṯ*, Tashelhit *yan / yat*, etc., (S) Tahaggart *iyān / iyāt*, Ghat *iyyən / iyyət* etc., reflecting pBe **yīw-ān/ -āt*. Reconstructing these archetypes, Prasse (1974: 403–04) sees in them a participle of the root **yīw-* "to be alone, unique", comparable with Eg *wʕy* id. (cf. already Zyhlarz 1931: 135). A regular Berber corresondence to Semitic **ʕ* is probably **y* alternating with a zero-reflex (Vycichl 1991: 383–86). Vycichl (DELC 518) found a convincing cognate in the Semitic root **w-ʕ-y* > Ar *waʕā* "rassembler, réunir sur un seul point, être guéri (se dit d'un os fracturé dont les éclats se réunissent); to collect, gather", He *yāʕāh* "ramasser, balayer; to sweep together and carry away" (Klein 1987: 261). On the other hand, the comparison of Eg **wiʕy-* with Se **wāḫid-* (Zyhlarz 1931: 135) is improbable because of its phonetic and structural incompatibility.

b) Being a representant of the Rössler's school, Schenkel (1990: 55) compares directly the Eg root **wʕʕ.w* and Ar *wāḫidun*. He assumes a regular correspondence between Eg *ʕ* = **ẋ* vs. Se **ḫ* on the one hand, and Eg **ʕ* vs. Se **d* on the other hand.

2. Reconstructing the development of m.**siny-ū-āy* > **sini-ww-āy* > CoS ⲥⲛⲁⲩ and of f. **síni.t-āy* > **sínt-āy* > CoS ⲥ̄ⲛⲧⲉ besides **sinya.t-āy* > **sinā.t-āy* > CoB ⲥⲛⲟⲩ†, Vycichl isolates the root **siny-*, a plural marker **-ū-* and a dual marker **-āy* (Vycichl 1957: 364; 1959: 64; 1974: 62; DELC 192). In his contribution presented at the Congress of Coptic Studies at Mün-

ster in 1996, Satzinger proposed his solution: m. **sinăwaĭ* > **snă'w* > CNAY, f. *sinătaĭ* > **snătə* > CNOY†. The *i-* vowel is supported by a cuneiform transcription *ši-na* known from El-Amarna tablets (Albright; quoted after Dolgopolsky 1992: 68, #81).

It was already Brugsch who compared this numeral with its Semitic counterpart (cf. Erman 1892: 118), cf. Ak *šinān* m./ *šittān* f., Ugaritic *tnm* / *ttm* [*tināmi* / *tittēmi*], Hb *šĕnáyim* / *šĕttáyim*, Ar *itnāni* / *itnatāni* & *tintāni*, Sabaic *tny* / *tnty* etc. (Brugnatelli 1982: 133–141). Dolgopolsky (p.c.) reconstructs pSe m. **tín-ā-ni*, acc.-gen. **tín-ay-ni* and f. **tín-at-ā-ni*, acc.-gen. **tín-at-ay-ni*, segmenting the numeral into the root **tin-*, a dual marker **-ā-* (nom.), **-ay-* (acc.-gen.), a feminine exponent **-at-* and a determiner **-ni-*, not appearing before nouns.

An evident cognate also appears in the Berber numeral "2": Guanche (Gran Canaria ?) *smetti* [=*sinetti*], *smatta marava* "12", (Tenerife ?) *sijn* "2", *sinir marago* "12" (Woelfel 1954: 3, 22–23); (E) Siwa *sən* m. / *sənət* f., Sokna *sən* / *sənt*, Fodjaha *sən* / *snət*, Ghadamsi *sən* / *sənat*, (N) Kabyle *sin* / *snat*, Wargla *sin* / *sent*, Zayan *sin* / *sant* etc., (S) Tahaggart *əssin* / *sänât*, (W) Zenaga *šinan* / *šenanet* etc. Prasse (1974: 403–04) reconstructs pBe **sīn* & **hissīn* m. vs. **sināt* f.

The numeral "2" reconstructible on the AA level as **činy-*, **čin-ay-*, is the only numeral attested safely in three AA branches. The attempts to find relatives in other branches are not convincing: Dolgopolsky (1973: 111) also seeks parallels in CCu (=Agaw) and SCu. But it was already Reinisch (1887: 306) who recognized an Ethio-Semitic borrowing in Bilin, Qwara & Dembea *səna* "Gleichniss, Ebenbild, Art; (gleich)wie", cf. Geez *sənʔ(ā)* "peace, agreement, harmony; like-minded", *sənʔəw* "equal, agreeing" etc. (Leslau 1987: 504–05). Iraqw *dangi* "twins" together with related Alagwa *irangayo* "twin", reflect pSCu **ʔidaŋ-* (cf. Ehret 1980: 166), a form very probably incompatible with AA **čin(y)-* "2" for phonetic reasons. A much more convincing cognate to SCu "twin" appears in WCh **ǯanV* "twins" > Angas & Ankwe *ǯan*; Sha (Ron group) *ǯân* 'suppletive pl. to *'awúllàwúl* "twin"' (Stolbova 1987: 195, #465), sometimes also derived from AA **činy-* "2" (so e.g. Dolgopolsky 1992: 69, #81).

3. Eg **ḫamt-* "3" has no evident cognates among AA numerals. The comparison with Semitic **talāṯ-* / **šalāṯ-* "3" proposed by Albright is rather forced (1918: 91 *ḫmt* < **ḫnt* < **šnt* < **šlt* < **θlθ* !). A comparison with Semitic **ḫamíš-* "5" (so Sethe 1916: 23 and Ember 1917: 88, fn. 1) is not a better solution (Loprieno 1986: 1315–16, fn. 18 reacts: "Die Äquivalenz äg. *ḫmt* "3" ≡ semitisch *ḫmš* "5" ... vermag ich weder phonologisch noch semantisch zu verstehen").

But it was already Zyhlarz 1931: 135–36 who discovered a hopeful cognate in Guanche (Gran Canaria ?) *amelotti* "3", *amierat-marava* "13", (Tenerife ?) *amiet*, *amiat* "3", *amiago* "30" (Woelfel 1954: 4–6). It is accepted

skeptically by Woelfel l.c., but positively by Rössler (1966: 228; 1971: 284) and Schenkel (1990: 56). In the case of semantic identity the validity of the etymology depends only on phonetic corresondences. Concerning Berber(-Guanche) correspondences to Egyptian *ḫ, there is not common opinion. The best substantiated is the correspondence to Berber *γ proposed by Zyhlarz 1934: 113; cf. Eg *ḫr* "bei, von, zu" (Wb. 3: 315–16) and Berber: (S) Tahaggart *γur* "chez", (N) Kabyle (Mangellat) *γuṛ* "chez", *γeṛ* "vers" (Dallet), Tamazight (Ayt Ndhir) *γər*, (before pronoun) *γur* "to, toward" (Penchoen), (E) Ghadames *ɛūr* "chez" (Lanfry) etc. (Edel 1955/64: 2; Prasse 1972: 229). Another correspondent can be Berber *ḫ (sometimes an allophone to *γ), cf. Tuareg *éḫělbes* "papillon" vs. Eg (nK) *ḫnms* and (med, xviii) *ḫnws* "moustique" (Wb. 3: 295, 290; DELC 260–61). Militarev (1991: 167–68) demonstrated that Berber *γ /*ḫ corresponds to Guanche *j* [*x*], *x*, *ch*, *h*, *g* (probably only orthographic variants of the same sound) and also ∅. It means that the initial correspondence can be regular. The second question is the correspondence of the third radicals. There are two possibilities: (i) The most conservative are the forms *amiat*, *amiet* (Tenerife), corresponding one-to-one with Eg *ḫamt-. The final *-at*, *-et* in Guanche probably represents a marker of feminines or abstract nouns. On the other hand, Eg *-t-* looks as a part of the triradical root. The only possibility is also to assume a frozen marker of abstract nouns in this *-t-*, hence **ḫamt-* < **ḫám*[*ya*]*t-* "Dreiheit", where the second syllable would be reduced under the influence of gender markers **-aw* / **-at*. (ii) If the forms from Gran Canaria preserving a liquid are more archaic, the Guanche-Egyptian isogloss is not so unambiguous. The liquid **-l-* or **-r-* has no counterpart in Egyptian. The *-n-* in Sahidic ⲥⲱⲙⲛⲧ is 'parasitic'. It appears automatically in more Sahidic words before ⲧ, frequently between ⲙ and ⲧ (Vycichl 1990: 223–25). Let us add that later Zyhlarz (1950: 407) changed his sagacious etymology, reconstructing the Guanche numeral "3" as **amel'hǫḍ*ⁿ "der anderer Zeiger" = "Mittelfinger", cf. the Berber verb "zeigen", e.g. Tahaggart *amel* "indiquer", Kabyle *məl* "montrer" (Cohen 1947: # 9).

Meinhof 1912: 233 and Zyhlarz 1931: 136 also compared the Eg numeral "3" also with its Beja (North Cushitic) counterpart, varying in dialects: Halenga *mahây*, Arteiga *mhây*, Bisharin *emhay* (Hudson). It implies a syllable metathesis **hamáy* > *mahây*, perhaps caused by alliteration with the preceding numeral *mhaloo-* "2" (Hudson). This cognate is also possible, although not safe.

4. The numeral "4" has been reconstructed with initial alif on the basis of the abstract noun *ỉfd.t* "Vierheit", Middle Babylonian cuneiform transcription *ip-ṭa'-u* (Kammerzell 1994: 169 tries to demonstrate that a reading *pí* or *pé* is also possible) and CoA -ϩϥⲧⲉ in ⲙⲛⲧ-ϩϥⲧⲉ "14" and CoS -ϩϥⲧⲉ in ϫⲟⲩⲧ-ϩϥⲧⲉ "24". Vycichl (1940: 83) mentions the Coptic feminine form ϥⲧⲟⲉ, deriving it from **fdˇ wwˇ.t* and further **fdˇ3wˇ.t* < **fdo3wet*, similarly as ⲙⲉ "lieben" < **me3jet* < **mirjet* (**mirya.t* in DELC 106) or ⲡⲧⲉ

"Tempel" < **r3-pe3jew* < **-pirjew* (**ra3 pirya.t* in DELC 176). If one accepts the preceding thoughts, could the numeral be reconstructed as **fida3ẇa.t* or **ifda3wa.t* < **fidarwa.t* or **ifdarwa.t* ?

Convincing cognates appear in the North and East branches of Cushitic languages, almost in all languages of the Omotic family (with the exception of Gatsama recorded by Conti Rossini, Yemsa, Dizoid and Mao groups) and Chadic family (here with the only exception of the South Bauchi group).

Beja *faDig* (Hudson; *D* is retroflexive), *fáḍig* (Roper, Almkvist), *faḍíg* (Reinisch) "4", *fáḍiga* "4th" can reflect older **fa*[*rd/ḍ*]*ig(a)*, cf. old records compiled by Almkvist 1885: v) *faḍḍeg* (Kremer), *fardik* (Krockow), *ferdik* (Lucas) vs. Beni Amer *farig* (Reinisch). Beja *fűḍa* & *fúrda* "Molo, Ankerplatz" borrowed from Arabic *furḍa(t)* "anchorage, sea-port" (Reinisch 1895: 82) can demonstrate that the development **-rd* > **-ḍ* is possible. Zyhlarz (1933: 167) recognized the plural (and dual) ending *-ga* (Roper 1928: 183) in final *-g(a)*. Probably also *-d(i)-* does not belong to the root. It could be a numerative derived from *da* "thing" (Reinisch) or related to *d(ə)ʔi* "alone" (Roper). Other possibilities are discussed below.

With the exception of Highland East Cushitic, Dullay and Yaaku groups, related forms are attested in all East Cushitic languages (cf. Zaborski 1987 with bibliographical data): Afar *ferey*, gen. *affara* (Parker & Hayward), Saho *áfar* (Plazikowsky-Brauner); Somali: Digil *áfar*, Benadir, Darod *affár* (Moreno), Af-Garre *afar*, *afur* (Lamberti), Jiddu *afár* (Banti), Boni *áfar* (Heine), Rendille *áffar* (Galboran & Pillinger), Bayso *áfar* (Hayward); Konso *afur-*[*i*], ord. *arf-atta*, D'irayta *afúr*, pl. *árf-a*, ord. *arf-tyyá* (Black), Mussiye *afurii* (Tanaba-Wedekind), Oromo: Borana *afuri*, ord. *abranu*, Maca *afur*, ord. *árfanu*, *arffe* (Leus); Arbore *ʔafúr* (Hayward), Elmolo *áfur* (Heine), Dasenech *ʔaffur* (Sasse). The difference in vowels between **ʔaf(f)ar-* vs. **ʔaf(f)ur-* resembles that of patterns of broken plurals known in Saho, e.g. *araḥ* "road", pl. *áruḥ* (Welmers) and Afar *dắnan* "donkey", pl. *dắnun* (Colizza), see Zaborski 1986: 45. The suffix *-ey* in Afar (*-oy* and *-ay* too) probably represents a collective, frequently followed by a singulative *-tu* or *-ta* (cf. *fereyta* "a game with four players") — see Zaborski 1973–74: 27. On the other hand, Afar nom. *ferey* vs. gen. *affara* (*fire* vs. *affa'ra* after Bliese) allows to isolate a preformative **ʔa-* with a primarily adjectival and abstract function, known not only from the Cushitic (e.g. Rendille *abur* "big"), but also from the Semitic and Chadic languages (Zaborski 1974: 81–87). The preceding analysis indicates the primary root **far-*.

The Omotic numerals were studied by Zaborski 1983. The following overview is based on the most recent records:

Aroid: Aari *ʔoidí* (Hayward), Ubamer, Galila *oyddi*, Hamar-Banna *oydi*, Dime *uddu* (Fleming);

Gonga: Shinasha *áwddá* (Rottland), Wembera *ʔàwddà* (Alga & Wedekind), Mocha *awúddo* (Leslau), Anfillo *auddo* (Grottanelli), Kafa *awude*, *awudo* (Habte);

Gimira: Benchnon *od* (Breeze), She *od* (Conti Rossini), "Gimira" *ottu* (Toselli);

Chara: *obdá* (Aklilu Yilma), cf. *ourtōntsā* "40" (Cerulli);

Ometo (proper): (W) Basketo, Doko *oyddi* (Fleming); (S) Male *ʔoi'do* (Siebert); (C) Wolayta *oydda*, Gofa, Gamo, Dorze, Kullo *ʔoydda* (Alemayehu), Dorze *oyDa*, Malo *oydda*, Oyda *oyddi* (Fleming), Zala *oídda* (Moreno) ; (E) Zayse *ʔoydd* (Hayward) = *ʔoit*, Zergulla *hoid*, Ganjule *'ʔood*, Gatsama *ʔooidu*, Koyra *ʔɔddɛ* (Siebert-Hoeft), Mezo *woydi* (Chiomio) etc.

On Proto-Omotic level an archetype **ʔaβurd-* or sim. could be expected.

The three branches (W, C, E) of the vast Chadic family can be classified into 27 groups. With the exception of South Bauchi there are related forms of the numeral "4" in all groups. The forms without any source are quoted after Jungraithmayr & Ibriszimow 1994, II: 152–53.

Western Chadic **firadu* (Stolbova 1987: 160, # 136)

1) Hausa: Hausa *húɗú / fúɗú*, Gwandara *puru, furu, huru* (Matsuhita);

2) Angas -Ankwe **fiir* (Stolbova) > Sura, Chip *fɛ́ɛ́r*, Goemai (=Ankwe) *fʔɛɛr*, Tal, Montol *fɛi*, Yiwom (= Gerka) *prɔʔ*; cf. Angas *fiir* (Foulkes);

3) Ron: Fyer *pítt*, Daffo *púʔ*, Kulere *fúúd*, Sha *fúɗ*, ? Bokkos *bárás*;

4) Bole **fiardu* (Stolbova) > Dera *páṛáu*, Karekare *feɗu*, cf. Bolewa *pórdo* (Koelle) = *fòɗɗó* Bele *fóɗɗó*, Ngamo *hòɗò*, Kirfi *fáɗàu*, Gera, Geruma *fúɗú*, Galambu *páryá* (all Schuh), Tangale Biliri *faɗàu*, Pero *peɗéyù* (Kraft), Maha *paɗu* (Newman) etc.;

5) North Bauchi **(bi-)fUḍV* (Stolbova) > Warji *fədî*, Tsagu, Mburku *fədə*, Kariya, Miya *fùdù*, Pa'a *fáɗù*, Jimbin *fíɗí*, Diri *fíɗíí*, Siri *bûfədi* (Skinner);

[6) South Bauchi: Geji *wupsî*, Buli *wùstu*, Jimi *ishwo* etc.; these forms are probably unrelated;]

7) Bade-Ngizim: Ngizim *fúɗú*, cf. Bade *fədu* (Kraft), Duwai *fudu* (Koelle);

Central Chadic:

8) Tera: Tera *vat* (Newman), Pidlimdi *vàɗi*, Gabin *fwəɗə*, Hwona *faɗà* (Kraft);

9) Bura-Margi: Margi *fòɗù*, Chibak *fɔ́ɗuu*, cf. Bura *fwaĩ*, Kilba *fôdù*, Hildi *fwɔɔɗù* etc. (Kraft);

10) Higi: Higi *fwáre*, Higi Ghye *fwaɗ*, Fali Kiria *fwaɗù'* (Kraft), Bana *fáɗə̂*, Kapsiki *ùfáɗ* (Wente-Lukas) etc.;

11) Bata: Bata *fwǫt*, Nzangi *fwat* (Mouchet), Bachama *fwat'* (Carnochan), Mwulyen *fwad*, Gudu *fwád*, Fali Mucela *fwəɗ*, Gude *'ùnfwaɗ*, Fali Jilbu *fwəy* (Kraft);

12) Lamang: Hidkala *úfáɗá*, Alataghwa *úfada*, Vizik, Turu *ufat*, Lamang *ùfáɗò* (Wolff) = *fəwaɗ*, Hide *məfaɗ* (Colombel);

13) Mandara: Wandala *úfáɗɛ́*, Glavda *úfàḍ*, Guduf *(w)ùfʌ́ɗ*, Dghwede (= Truade) *fídî*, Ngwashi *ùfáɗù*, cf. also Paduko *wəfaɗ* (Colombel), Nakatsa *wòfaɗa* (Kraft);

14) Sukur: Sukur *fwát*;

15) Matakam **ma-faɗ* (Rossing 1978: 346, #289): Mafa *faɗ*, Mofu *ɱfàɗ*, Muktele *ùfàɗ*, cf. also Mada *wəfaɗ*, Hurzo *fəwdəw* (Colombel), Gisiga *mùfàɗ* (Lukas), Muturua *mufát* (Strumpell), Baldamu *mòovún/l* (Seignobos & Tourneux); the same prefix forms also the numeral **ma-kar*, see Rossing 1978: 346, #739);

16) Daba: Daba *fɔɔɗ*, Musgoy *fwọd*, Kola *fʷɔ̀ɗ*, cf. also Hina *fa* (Strumpell);

17) Gidar: Gidar *pǫ́do* (Mouchet);

18) Kotoko **γaḍi* < **kV-faḍi* (?): Yedina (= Buduma) *hááγay*, cf. also Logone *gáɗe*, Shoe *gade*, Gulfei *gaanḍé*, Kuseri *káade* (Lukas), Affade *wagaade*, Ngala *kaadi*, Makeri *gaade* (Barth);

19) Muzgu: Muzgu *poodu* (Barth), *poru* (Decorse), *puddu* (Overwegg), *fuudi* (Röder), Mulwi, Mbara *púɗɗú* (Tourneux);

20) Masa: Masa *fiɗi*, Banana, Misme (Zime) *fidi*, Lame *fùɗìʔi*, Lame (Peve) *fúɗii* (Kraft), Dari *fudi* (Lukas);

East Chadic:

21) Kera: Kera *waaɗe*, Kwang (= Modgel) *wùɗaay*;

22) Lai: Lele *pooriiŋ*, Kabalai *pərį*, cf. also Nancere *pori*, Gabri, Dormo *porin* (Adolf Friedrich), Darbe *pudi* (Bruel), Chire *pórbu* (Barth);

23) Sumray: Sumray *wʌʌdəə*, Ndam *wèètii*, Tumak *wəri*, cf. Sumray *woyti*, Ndam *wayti* (Barth), Gulei *uori* (Alfred Friedrich), Miltu *wedi*, Sarwa *we* (Decorse);

24) Sokoro: Sokoro *pááda* (Nachtigal) = *faada* (Barth), cf. Barein *fudu* (Lukas);

25) Dangla: Dangla *pòòt*, *pòòɗ*, Migama *póóɗí*, cf. also Bidiya *paaɗaŋ* (Alio);

26) Mokilko: Mokilko *pɪɗé*;

27) Mubi: Mubi *fáɗà*, Birgit *fòòɗì*, Jegu *food*;

Newman 1977: 26, #54 reconstructs pCh **fʷaɗə*. The approach of Stolbova to the reconstruction is probably more fruitful. She explains the irregularity in WCh **-ɗ-* vs. Angas-Ankwe **-r-* instead of the expected **-t-* (Stolbova 1987: 70–71) as a result of the cluster **-r(V)d-*. This idea should be generalized for all the Chadic family. Her WCh reconstruction **firadu* (p. 160, #136) can be inspirative for proto-Chadic reconstruction. The modifications like **faridu* (> **firdu* > **fiɗu* > **fuɗu* or sim.) or **farudi* (> **fuardi* > **fwaɗi* or sim.) perhaps agree better with the concrete forms. The same suffix **-di* probably also forms the numeral "3" in some groups, e.g. North Bauchi **kundi* > Jimbin *kə́ndɪ́*, Siri *bukudde*; Masa: Zime-Batna *híndzìʔì*, Masa *hidi*; Mandara: Glavda *xkə̀rda* (*-r-* < **-n-*) etc. (Jungraithmayr-Ibriszimow 1994, I: 168 and II: 326–27). This **-d[i]* can be hypothetically connected with Kotoko **di* "thing" > Yedina, Logone, Affade *di*, Ngala *ndi*, cf. Affade (Lebeuf) *dipal* "the first" vs. *pal* "one" (Sölken 1967: 77). If we accept the preceding analysis, the root **far[i]-* or **far[u]-* can be determined in the Chadic numeral "4".

After partial reconstructions in individual families a projection on the proto-Afroasiatic level should follow. The forms reconstructed above are compatible assuming the following hypothetical scenarios in internal reconstructions:

pEg **fida[r]wa.t* < **faridwa.t* ?
pBeja **fa [rd]ig* < **fari-da-g(a)* ?
pEast Cushitic **far-* & derivative **ʔaf(f)ar-*, pl.**ʔaf(f)ur-* ?
pOmotic **ʔa[β]urd-* ?
pChadic **fari-du* or **faru-di* ?

It is evident that the numeral "4" consists of the root **far-* plus *d*-extension (with the exception of ECu), eventually with **ʔa-* (**ʔi-* ?) prefix (ECu, Om, ? Eg). The most hopeful etymology seems to start from AA **far-* "finger" attested in East Cushitic, Omotic (?) and Chadic (Blažek 1990: 29; Kammerzell 1994: 174). Black 1974: 117 reconstructs LECu **fer-* "finger" on the basis of Afar *feera*, pl. *feeraari* (Parker & Hayward), Saho *fera* (Reinisch), Somali, Boni *far* (Heine), Rendille *fár*, pl. *farró* (Galboran & Pilgrim), Bayso *fer*, Arbore *farró* (Hayward), Elmolo *fārr* (Heine). Bilin *gʷənda-filléra* "thumb" = "thick finger" (*gʷənd-* "be thick" — see Reinisch 1887: 154) seems to be the cognate in Central Cushitic (= Agaw). In Omotic, Koyra *partaa* and Chara *hartsaa* "finger" (Cerulli) are probably related. The position of the counterparts with the initial voiced labial (Wolayta *biraḍḍiya*, Kullo *birradé* id.) is not clear. On the other hand, the Chadic parallles are more convincing: (W) Hausa *fárcèè*, pl. *fáràutaa* "fingernail", (Sokoto) "finger", Gwandara *apirači*; Kofyar pl. *furapsár*; (E) Dangla *péérmé*, Mubi *fèerí* "finger", Jegu *fillo* "fingernail", Migama *pùrrùn* id., etc. (Jungraithmayr & Ibriszimow 1994, II: 136, 247). A possible cognate appears perhaps also in Berber, cf. Izayan *ifˇdẹn*, pl. *ifeˇḍnạn* (Loubignac), Iznacen, Rif *ťafḍént* (Renisio), Ghadames *tafadənt* (Lanfry) "toe". The Be **-ḍ-* (but why Ghadames *-d-* ?) reflects probably not only AA **-ṭ -*, but also **-rd-*, cf. (E) Siwa *iṭ*, Augila *awd*, Fodjaha *ayåḍ*, Ghadames *īẖeḍ* ; (S) Tahaggart *ehŏḍ*, Ayr *ehăḍ*, Ghat *ihəḍ*; (W) Zenaga *īḍ*; (N) Semlal *íḍ*, pl. *aḍán*, Iznacen *êḍ*, Gurara *īḍ* etc. "night" (collected by A. Militarev) vs. Chadic: (W) Sura, Angas *par*; Karekare *bèèďì*, Dera *bə́ṇ*; Kulere *má-fòď*; Guruntum *vùru*; Ngizim *di-viď*; (C) Tera *viď-ki*; Bura-Pela *viri*; Gude *vɪda*; Lamang *vídí*; Guduf *viďe*; Sukur *vət*; Mafa *váď*; Daba *vùďū*; Gidar *də́fḍạ*; Kotoko: Logone *váďè*; (E) Sokoro *báďùm* id. (Jungraithmayr & Ibriszimow 1994, I: 128–29; II: 256–57). Newman 1977: 29, #92 has reconstructed pCh **bəďi*; a better solution is perhaps presented by Stolbova (1987: 154, #91), reconstructing pWCh **bardi* (cf. also Fali Gili of Higi group (CCh) *wɨ̄ďī* recorded by Kraft).

Besides the possibility described above concerning the dental component of the numeral "4", i.e. a numerative originally perhaps meaning "thing", there are other no less tempting solutions: (i) a compound **far[ū?]-yad...*"fingers of a hand (i.e. without thumb)"; (ii) a compound "finger-span", where the second component can be related to Ak *ūṭu(m)*, in As 1x *īṭu(m)* "Spanne, Halbelle" (AHw 1447). Eg *d* corresponds to Se *ṭ* regularly; in Beja an alternative proto-

form **farḍig* is also possible, similarly in Chadic the reconstruction can be modified in **fariḍu* or sim. The weakest aspect of this etymology is an uncertainty about the original initial consonant of the Akkadian word. Vycichl (1985: 173) collected the following 'candidates', giving regularly a zero-reflex in Akkadian: *ʔ*, *ʕ*, *h*, *ḥ*, *ġ*, *y* and *w*. Only the 'glides' *ʔ*, *y* & *w* satisfy; the laryngeals and pharyngeals would be preserved in Egyptian.

In his brilliant study devoted to the Egyptian numeral "4", F. Kammerzell presents important data supporting the 'finger'-etymology. He mentions the similarity of the numeral "4" and the verb *fd* "herausreissen, auslösen" in Egyptian (1994: 173); cf. also Angas (WCh) *fiir* "to scrape with fingers" vs. *fiir* "4" (Foulkes 1915: 177). It is evident that just the "finger" represents the semantic bridge connecting the meanings "4" and "scrape, scratch".

There are also attempts to connect the Semitic and Berber numerals "4" with the Egyptian, Cushitic, Omotic and Chadic counterparts. The Semitic numeral "4" reconstructed by Dolgopolsky (p.c.) **ʔarbáʕ-u(m)* f. and **ʔarbaʕ-át-u(m)* m. agrees with the Eg-Cu-Om-Ch isogloss "4" only in the consonant *r*. Dolgopolsky (1973: 231–32; 1983: 125) assumes a metathesis in Semitic comparable with the Oromoid cardinal **afur-* vs. ordinal **arf-*. But he is not able to explain the difference *f* : *b* between East Cushitic and Semitic. F. Kammerzell 1994: 180 reconstructs pre-Eg **fiṭṭá-* (in agreement with the Rössler's reinterpretation of Egyptian consonantism) < **firṭá-* < **firdá-* and compares it with Se **ʔ-r-b-ʕ*, assuming a metathesis **(ʔ-)b-r-ʕ* "4" (1994: 180). In the initial syllable **ʔa-*, a preformative can be identified, cf. the ordinals **rabuʕ-* (Akkadian), **rabīʕ-* (Hebrew-Aramaic), **rābiʕ-* (Arabic, Geez) (Gray 1934: 71). The idea of Kammerzell identifying the hypothetical cluster **-rd-* in Eg & Ch with the segment *-r-ʕ-* or *-ʕ-r-* in Semitic, was formulated already by Stolbova (1987: 96–97). The same process is described in the ECu language D'irayta, where the cluster **-rʕ-* changes regularly in *-ṛḍ-*, cf. *kárḍ* "belly" vs. Bussa *karʔ-a*, Gawwata *karʕ-étto*, Arbore *geréʔ* < LECu **garʕ-* (Black 1974: 207). In spite of the attractivity of this solution, the difference *f* : *b* remains unexplained. Zyhlarz 1931: 136 rejects the comparison of the numeral "4" in Egyptian and Semitic, because the Se root *r-b-ʕ* implies Eg ***rfḫ*. This idea is based on an (irregular) correspondence between Eg *sfḫ* and Se **sabʕ-u(m)* f. "7". Let us add that the hypothetical pre-metathesized form without the preformative **ʔa-*, namely **b-r-ʕ*, remarkably agrees with Oromo of Wellega *barʔuu* "palm of hand" (Gragg) and eventually with the Omotic words denoting finger quoted above (**biraḍ-* < **birʕ-* as in D'irayta ?). Stolbova 1987: 68 proposes a different etymology, comparing the Semitic numeral "4" with WCh **rabu* "2" > Hausa *rábì* "half"; Tangale *rap* "2"; Diri *rɔ́búú*; Wangday *rwàp*, etc.; cf. Tera (CCh) *rap* "2" (Jungraithmayr & Ibriszimow 1994, II: 332; but they seek an origin in Jarawan Bantu, cf. I: 171). Finally, there is a possibility of an internal Semitic etymology based on the verb attested in Geez *rab(a)ba* "to stretch (out), extend, spread out", Ar *rabba* "to arrange" (Leslau 1987: 460–61) and the hypothetical root **ʕ..*, known from Eg

ʃ "arm, hand", ʃ.*t* "member (of body)" (Wb. I: 156, 160). Lacau 1970: 17 finds its Semitic cognate in the preposition "with" attested in Ar *maʃa*, He, Aramaic *ʃim*, Syrian *ʃam*, Sabaic *ʃm* (Brockelmann 1908: 498), cf. Eg *mdj* "with, by" (Wb. II: 145), orig. "in hand" (DELC 145) and formally corresponding *m-ʃ* "in hand; together with, because of, from" (Wb. I: 156; Callender 1975: 19). The primary meaning of the hypothetical compound **r-b & *ʃ..* could be *"stretched hand" > "4". If we accept one of these etymologies, the only conclusion is possible: the Semitic numeral "4" is not related to its counterparts in the other AA branches.

The original Berber numeral "4" is attested in all branches, cf. (E) Ghadames *aqquz*, (S) Tahaggart *ǒkkoẓ*, (W) Zenaga *akkuṭʰ*, (N) Semlal *qquẓ*, Baamrani *kkoẓ* etc. including Guanche (Gran Canaria) *acodetti* (collected by Militarev, p.c.; cf. also Woelfel 1954: 6). Prasse 1974: 403, 405 reconstructs pBe **hakkūẓ*. It is evident that the Berber protoform **ʔfẓ* proposed by Jungraithmayr & Ibriszimow 1994, I: 73 as a cognate to Chadic and Egyptian data is not well-founded and consequently the comparison is impossible. On the other hand, there is a more hopeful cognate in Berber. Skinner 1994: 106 adds Tahaggart *əfəḍ* "to multiply" and *êfəḍ* "innumerable quantity; million" < **hifiḍ* (Prasse 1974: 407). The semantic dispersion is comparable with the semantic field of the Semitic root *r-b*: **r-b-b* "to be numerous" > He *raḇ*, Ar *rabba*, Ak *rabābu* "to make big" vs. He *rebābā*, Ug *rbt*, Aramaic *ribbabtā* "10.000" (Aistleitner 1965: 286–87) & **(ʔ-)r-b-ʃ* "4" (if related, it represents the fourth possibility to etymologize the Semitic numeral "4").

5. The numeral "5" (m.) has been vocalized **dǐ́yaw* or sim. (Edel, Osing, Schenkel, Loprieno). But Vycichl (1985: 176) mentions that the unaccented final *-aw* disappears in Coptic. He derives CoS m. ϯⲟⲩ & f. ϯⲉ from **diwěy & *diwě.t*. In the case of the abstract numeral ("pentade") attested in Eg *dj-w.t* and CoS -ⲧⲏ he reconstructs **dawīya.t* > **dayīya.t*. A satisfying solution can probably be found in the influence of the numeral "50" (unattested in Egyptian): CoS ⲧⲁ(ⲉ)ⲓⲟⲩ (besides irregular B⁰ ⲧⲉⲃⲓ instead of ⲧⲉⲟⲩⲓ). The same termination forms the numeral ⲡⲥⲧⲁⲓⲟⲩ "90". Reconstructing **-īy-ū* > **-īw-ū*, Vycichl sees here an old plural comparable with Ar *ḫams-ūn* "50" vs. *ḫamsat* "5" (DELC 223). Accepting the preceding explanation, there is no reason to reject the old identification of the numeral "5" and the word "hand", reconstructed on the basis of the 'hand'-hieroglyph with the phonetic value *d* and the preposition *mdj* "by" (MK), lit. "in hand"; cf. CoS ⲛ̄ⲧⲁ-ⲟ "by him"). Lacau (1970: 12) assumes the original form **ỉd*, comparing the word *ỉbḥ* "tooth" with the sign *bḥ*, depicting "tusk". Vycichl (1985: 177) presents the vocalic reconstruction **yadīy-u* "hand" and **ma-yadīy-u-fi* "in-hand-his" > **medī-fi* > **medíf* > **mdíf* > ⲛ̄ⲧⲁⲟ. The reconstruction of the initial syllable **ya-* is motivated by the suggestive cognate in the Semitic word for "hand": Ak *idu(m)* "arm, side, power", Ug, Ph *yd*, He *yaḏ* "hand", pl. (orig. du.) *yāḏáyim*, Aramaic *yəḏ-ā*, Syrian *ʔīḏ-ā* "the hand", Ar *yad* "hand, arm", pl.

ʔaydiy, Sabaic *yd* "hand", Geez *ʔəd* "hand, arm, handle, haft, part, side, place", pl. *ʔədaw & ʔaʔdāw*, Tigrinya *ʔid*, Amhara *əgg* "hand", Soqotri *ʔed*, du.*ʔidi*, pl.*ʔedhéten*, Śheri *ʔed* "hand", Mahri *ḫayd* "hand, arm, armpit", pl. *ḫadōten* (*ḫa-* is a prefix with the article function) etc. (Leslau 1987: 7). Conti 1990: 172 also finds this word in Eblaite: *ma-u$_9$ i-da* or *ma-wu i-da-a* = */māyū yiday(n)/* "water for hands" (du.). Vycichl (1985: 174) proposes a triradical root *y-d-y*, probably **yadīy-u*.

An evident genetic connection of the numeral "5" and the word "hand" also appears in Beja: *ɛy* "5" vs. *ayi, ɛyi* "hand, forearm" (Roper), *ay, äy* "5" vs. *ay* "hand, (fore)arm" (Reinisch). These forms could be even related to the Se-Eg isogloss "hand" & Eg "5" analyzed above, if the loss of *-d-* before *-y-* is regular. A satisfying example supporting this change can perhaps be found in *gwedi* "eye", pl. *gwey* (Almkvist).

Rössler 1971: 285–86 presents a different comparanda to Se **yad...* "hand" in Egyptian, starting from his reinterpretation of the Egyptian historical phonology. He sees a cognate in Eg ʿ "arm, hand, side", cf. the parallel forms in Eg *r-ʿ* "bis hin zu, neben" vs. Ar *ladā* (*l-dy*) id. On the other hand, Knauf 1982: 29–39 finds a Semitic cognate to Eg *d* ('hand'-hieroglyph) in Ak *ūṭu & īṭu* "Spanne, Halbelle". The meanings are, in principle, compatible. Eg *d* corresponds regularly to both Se **d* and **ṭ*. Only the question of the anlaut remains open. In Egyptian the 'weak' consonants *3, i, y, w* can be expected. In Akkadian all the Semitic laryngeals, pharyngeals and glides (**ʔ*, **y* and mostly **w*) with the only exception (*ḫ*) dissappear. It means that Zeidler's comparison with CSe **ḫawiṭ-* "thread, fibre" > Ar *ḫayṭ*, He *ḥūṭ* (*Göttinger Miszellen* 72 [1984]: 39–47) cannot be valid. The same development as in the case of pSe **yáwam-* "day" > Ar *yawm-*, Geez, He *yōm*, Akk *ūmu(m)* (Dolgopolsky 1992: 44, #54) can perhaps be assumed, i.e. Ak *ūṭu* (& *īṭu*) < **yáwaṭ-*. If this eplanation is valid, the comparison of Eg *d* (**id* after Lacau 1970: 12–13) "hand" (or "a part of hand") and pESe **yá waṭ-* > Ak *ūṭu* (& *īṭu*) "Spanne, Halbelle", is plausible.

6. The most archaic form of the Eg numeral "6" is preserved in MK *srs* "six-veawe linen" (Wb. IV: 200; cf. also p. 40 and Edel 1955–64: 169). The following scenario is probable (for m.):

**sirsáw* (only Loprieno 1986: 1308 and 1995: 71 reconstructs **-a-* in the first syllable) > **siśsáw* > **iissáw* (cf. alliteration with *sw* — see Černý 1976: 167 and MBa cuneiform transcription *ša-u*) > Co **ϣωογ* (DELC 200). CoS ⲁϣⲉ in ϥⲁⲣⲣⲁϣⲉ "96", originally abstract, reflects **iissat* (Edel 1955–64: 176; Sethe 1916:18 reconstructs ** 'ăśśet*). CoSB ϣⲉ "60" can be derived from a collective **si3sl.t* < **sirsl.t* (DELC 182); cf. also the alliteration with *s(3wy)* (Černý 1976: 167). Loprieno 1995: 71 reconstructs m. **sjs.w (*saʔsew)* "60".

The numeral "6" has usually been compared with its counterparts in Semitic (Brugsch, see Erman 1892: 117), Berber (Zyhlarz 1931: 134, 137) and Hausa (Vycichl 1934: 77). Let's analyze the concrete forms:

Se **šíd[u]ɬ-u(m)* f. & **šid[u]ɬ-át-u(m)* m. (orig. a collective) (Dolgopolsky p.c., cf. 1992: 237) > Ak ? / *šeššet*, OAs *šedištum* ord. *šeliššu(m)* / OBa *šeduštum*, OAs *šedištum* (AHw 1220), Ug *tt* / *ttt*, ord. *tdɬ* = **tittt-* / **tittat-*; **tādiɬ-* (Segert 1984: 53), Ph *śś* / *śišt* = **šēš* / **šišt*, He st. abs. *šeš* / *šiššā*, st. constr. *šeš* / *šešɛɬ*, Aramaic *šiɬ* (*šēɬ*) / *šittâ*, Ar *sitt* / *sittat*, ord. *sādis*, EpSAr $s_1dɬ$, $s_1ɬ$ / s_1dtt, s_1tt, Geez *səssu* / *sədəstu*, g. com. *səds*, Tigre *səs*, Tigrinya *šəddəštā*, Amhara *səddəst*, Harari *siddisti*, Gurage *sədəst*, Soqotri *híte*, *'íte*, *yíte* / *hyat* (Leslau), *y(h) aʕt* / *hyəʔtəh*, Mahri *hēt* / *yətēt*, Harsusi *hāttəh* / *yətēt*, Śheri *šɛ́t* / *štət* (Johnstone) (Brugnatelli 1982: 133–41; Leslau 1987: 486–87).

Be (i) **sūḍas* (or **sūḍus* ?) > (E) Ghadames *suẓ* (**suẓẓ* < **suḍs*) m. / *suḍsät* f., (W) Zenaga *šuðəš*.

(ii) **saḍīs* > (S) Tahaggart *səḍis* / *səḍisät*, Taitoq *saḍis* / *saḍisət* etc., (N) Semlal *sḍis* / *sḍist*, Tazerwelt *sddis* / *sddist*, Demnat *saddis*, *sdis* / *saddist*, Mzab *səz* / *səssət*; Guanche (Gran Canaria ?) *sesseti*; cf. *sesatti-marava* "16" (Prasse 1974: 403, 405; Woelfel 1954:7).

Ch: (W) Hausa *shíd(d)à*, Gwandara *šida*; NBauchi: Tsagu *šīcə*; Ngizim *sedu* (Koelle) = *zìdù* (Schuh), Bade *əzdù* (Kraft), 'Kallaghee' *zoodoo* (Bowdich) (Stolbova 1987: 176, #288 reconstructs pWCh **sidu*); (E) Kwang (= Modgel) *sidee*, Mokilko *zót* (Lukas) = *zóo(t)* (Jungraithmayr). There are also hopeful cognates in CCh: Gidar *serré* (Strümpell) = *θirre*, *šire* (Mouchet), Musgu **ŝaara-* > *saara* (Decorse), *ŝaara* (Krause), Munjuk *slàarà* (Seignobos & Tourneux), Mbara *ɬírá* (Tourneux) etc. The lateral sibilant represents a regular common Central Chadic innovation corresponding to pCh **s* (Newman 1977: 16, § 3.9.). The medial *-r-* can be derived from **-d-*, cf. Gidar *bíryạ*, Mbara *fré* "monkey" < pCh **bədi* (Newman 1977: 29, #85).

It is evident that in order to accept the relationship of the Egyptian numeral "6" with the quoted counterparts in Semitic, Berber and Chadic, it is necessary to explain the irregular correspondence Eg **-r-* vs. **-d-* (**-ḍ-*) in the other branches. It is interesting that a similar irregular change appears in the Omotic group Gonga, borrowing the numeral "6" from some Ethio-Semitic source (see above) with a substitution **-d-* > *-r-*: Kaffa *šírittoo*, Mocha *širítto*, Shinasha *širíttě*, *siirta* (Zaborski 1983: 384). Rössler (1966: 221) demonstrated that Eg *r* substitutes Se *d* in Egyptian transcription of Semitic proper names. Does it mean that the Egyptian numeral "6" was borowed from Semitic? In spite of the traditional point of view connecting both Semitic & Egyptian "6"'s genetically, it is not possible to exclude it. But there is still another solution: the Egyptian "6" on the one hand and the forms in Semitic, Berber & Chadic on the other hand can be **unrelated**.

The closest cognate of pEg **sirs-* (**sars-* after Loprieno 1986: 1308) "6" can be found in phonetically fully corresponding Se **ɬalāɬ-u(m)* "3" (with the variant **ŝalāɬ-u(m)*)! The Semitic forms are as follows: Ak *šalaš* / *šalāšat*, Ug *ɬlɬt* / *ɬlɬt*, Ph *šlš* / *šlšt*, He *šāloš* / *šəlošā*, Aramaic *təlāṯ(a)*, Ar *ṯalāṯ* / *ṯalāṯat*, EpSAr *ɬlɬ* / *ɬlɬt*, $s_2lɬ$ / $s_2lɬt$, s_2ls_3 / s_2ls_3t, Old Ethiopic *slst*, Geez *śalās* / *śalastu*,

Tigre *säläs*, Tigrinya *säläste*, Amhara *sost*, Harari *šiʔišti*, *šīšti*, Gafat *sʷostä*, Soqotri *śilɛ* / *śaʃtɛh*, Mahri *śhəlɛ́ɬ* / *śāɬáyt*, Harsusi *śəláyś* / *śāɬáyt* & *śāfáyt*, Śheri *śhalíɬ* / *śaɬét* (Johnstone) (Brockelmann 1908: 236: dissimilation *ɬ-l-ɬ* > *ś-l-ɬ*; Brugnatelli 1982: 133–41; Leslau 1987: 529–30; Blažek 1990: 39: Eg + Se). The Eg form, if vocalized **sirs-*, corresponds to the Se pattern *qitl* attested e.g. in Ar *ṯilṯ* "je den 3. Tag", He *šilšōm* "vorgestern" (Brockelmann 1908: 492). The root *ɬ-l-ɬ* probably reflects an apocopated reduplicated formation *ɬ-l--ɬ-l*. Grande 1972: 307 connects the primary root *ɬ-l* with the Arabic verb *ṯāla* (*ṯ-w-l*) "to gather", cf. the derivatives: *ṯaul* "crowd, swarm of bees", *ṯawīlat* "bundle of herbs", *ṯulṯulān* "hay", *ṯullat*, pl. *ṯulal* "troop of people"; the mechanism of apocopy is described e.g. by Eilers 1987: 513 on the example of the Ar biradical nucleus *s-l*: *sāla* "to flow", *tasalsula* "to flow down", *salsāl* "sweet, cold water" vs. *salas* / *salāsat* (cf. "3" !) and *sail* "river, stream". Although Grande's etymology is semantically too vague, the separation of the root *ɬ-l* is fully acceptable. Its semantic motivation in Semitic remains open, but there are promising possibilities in other branches: Eg *s3ḥ* "toe" (Wb. 4: 20); ECu: Somali *suul* "thumb, big toe", Jiddu, Bayso *suul* "fingernail" (Lamberti) and Dahalo *tsoolo* "claw, nail" (Tosco). ECu & Eg *s* correspond regularly to Se **ɬ* reflecting pAA **č*. The primary meaning "thumb" can quite naturally serve to denotation of the numeral "6", cf. Bantu forms quoted by Hoffmann (1952–53: 71): Zulu *isithupha* "thumb; 6", Swazi *sitfupha* id.

The Semitic numeral "6" is analyzable at least in two ways:

(i) An apocopy of a fully reduplicated stem **šidšid-* (dissimilatory **šidš..* > **šidɬ-* or vice versa **ɬdɬ* > **šdɬ-* as Eilers 1984–86: 93 speculates ?). Did the original form mean a sum "3 + 3" ?

(ii) An apocopy of a compound **šid-ṯin-* "3 x 2" ?

An expression of the numeral "6" on the basis of the numeral "3" is known e.g. in Ug *ṯlṯm* "twice three" (du.) or *ṯlṯ w ṯlṯ* "3 + 3" (Gordon 1965: 503). On the other hand, the multiplication "3 x 2" has an analogy e.g. in Ngala (Kotoko group of Central Chadic) *kingi ti kisang* "6", where *kinga* = "3" and *kisang* = "2" (Migeod, see Sölken 1967: 174).

Both solutions identify the meaning "3" in **šid-*. An independent support of this hypothesis can be found in the Ak length measure *šīzum*, *šizû* "Drittel-Elle", *šizât* = $^1/_3$ *uṭṭat* (*uṭṭat* = "wheat") (AHw 1254). But Ak *-z-* reflects pSe **-ḏ-* or **-z-*. The first possibility allows a modification of the reconstruction of the numeral "6" in **šiḏɬ-* < **šiḏ-ṯin-*. The Ak form can be projected in pSe **šiḏC-u(m)*, where *C* = *w*, *y*, *ʔ*, *h*, *ḥ*, *ʕ*, *ġ*. Esp. the hypothetical form **šiḏḥ-* has a suggestive cognate in ECu **šizḥ-*/ *šazḥ-*/ **saziḥ-* "3" (Sasse 1976: 138; ECu **z* corresponds regularly to both Se **z* and **ḏ*, cf. Dolgopolsky 1983: 139–40) > Afar *sidoḥ*, gen. *sidiiḥa* (Parker & Hayward), Saho *ʃadoḥ* (< **aszVḥ*); Somali Isaq *saddeḥ*, Benadir *siddáḥ*, Jiddu *seye*, Boni *síddeh*, Rendille *séyyaḥ*, Bayso *seedi*; Oromo: Wellega *sadii*, Waata *séedi*, Konso *sessaa* (Black), *sezi* (Trento), Mashile *sessa* (Lamberti); Arbore *seezzé* (Hayward), Elmolo *séepe* (**-w-* < **-y-* < **-z-*), Dasenech *seddi*; Gawwada *iséḥ*, Gollango *izzéḥ*, Harso

ezzah, Dobase *siséḥ*, Tsamakko *zeeḥ*; Sidamo, Gedeo *sase*, Hadiya *saso*, Kambatta *sasu*, Burji *fadiya* (*f-* after *foola* "4") (Zaborski 1987: 331–42). The final **-ḥ-* determines some body part names in East Cushitic (and Afroasiatic in general), cf. **bidḥ-* and **kelḥ-* "left side/hand", **fanḥ-* "gap (between teeth)" vs. HECu **fan-* "open", **malḥ-* "pus", **matḥ-* "head" etc. The original meaning of ECu **šiz-(ḥ)-* should be a denotation of any part of body connected with tripartity. Perhaps Konso *sett-eetta* "instep, top of foot" (maybe related to Afar *sido* "sole of foot" < **sid(d)-* or **siz(z)-*) could be a plausible candidate, if the semantic development "top of foot" ⇒ "top of hand" ⇒ "middle finger" or sim. is possible. For completeness, the ECu numeral can also represent a Nilo-Saharan borrowing, cf. Kunama *saate*, Ilit *satte*; Berta *sittijini*; Berti (East Saharan) *soti* "3" (Bender). On the other hand, there is even an Asiatic candidate for the source of the hypothetical form **šid-* or **šiḏ-* "3" in Semitic, namely Elamite *zí-ti* "3" (Hinz & Koch 1987: 1305)!

The reconstruction of the numeral "6" in Berber is not evident. Besides the forms with alternating vocalism **sūḍas* (**sūḍus*) in E & W branches vs. **saḍīs* in S & N branches, there are NBe forms, where geminated *-dd-* appears instead of emphatic *-ḍ-*. The geminate is probably original, judging upon the patern with a medial geminate characteristic for **hakkūẓ* "4", **sammūs* "5", **tiẓẓāh* "9" and the long variants of simple stems in **hissīn* "2", **hissāh* "7", **hittām* "8" (Prasse 1974: 403–405). The skeleton *s-d-s* of the Berber numeral "6" corresponds regularly to Semitic, not regarding the reconstruction **šiḏṯ-*, **šiḏš-* or even **šiḏṯ-*. On the other hand, it is not excluded that Berber "6" (if not all the numerals "6–9") is borrowed from Semitic.

Concerning the Chadic (Hausa) numeral "6", Skinner 1994: 233 presents an inner Chadic etymology based on Hausa *sha* used in *(goma) sha ɗaya* "11", *(goma) sha biyu*, lit. "(10) plus 1", "(10) plus 2", etc.; hence *shidda* < *(biyar/t) sha guda* "(5) plus unit" ? A more transparent structure appears in Karekare (Bole group of WCh) *bəcoɗi* "6" < *bəɗi-*si-wəɗi* "5 plus 1", *bəcibèlu* "7" vs. *bèlu* "2" (after Kraft). A remarkable evidence is attested in Bade. Kraft quotes *əzdù* "6", but Koelle recorded *badṣṓdi* "6" = "5 + 1", consisting of *bā́du* "5" & *g-áde* "1". The same pattern is recognizable in ECh, e.g. Migama *bízgíɗyì* "6" = *béeɗyá* "5" + *káɗyì* "1" (Jungraithmayr) or Dangla *bídígéɗy* "6" = *béɛ́ɗy* "5" + *kèeɗy* "1" (Lukas). All the quoted examples can demonstrate the creation of the shortened form of the type *S-D* "6", originally "5 + 1".

7. It is generally accepted to vocalize the Eg numeral "7" **safḫ-*, cf. also MBa transcription *šap-ḫa* (DELC 203). It was already Brugsch, followed by Erman (1892: 118), who mentioned the similarity of the Semitic counterpart. Here Ak forms *sebe*, *seba / sebet(tu)* "7", *sebiat*, *selabat*, *sebītum* "Siebentel" (**sibʃ-*, but OAs *šabe* "7" !, cf. AHw 1033) differ from the forms in other Semitic languages, reflecting **šábʃ-u(m)* f., **šabʃ-át-u(m)* m.: Ug *šbʃ / šbʃ* = **šabʃ- / *šabʃat-*, Ph *šbʃ* = **šib(a ʔ)ʃ- / šbʃt*, He *šéḇa / šiḇʃā*, Aramaic *šəḇaʃ / šiḇʃâ*, Ar *sabʃ- / sabʃat-*, EpSAr *s₁bʃ / s₁bʃt*, Geez *sabʃ(u) / sabʃattu*, Tigre

sābuʃ, Tigrinya *šobʃatte*, Amhara *säbat*, Endegeň *säḫəʔat*, Harari *sātti*, Soqotri *yhóbeʃ / hyəbʃah*, Mahri *hōba / yəbáyt*, Harsusi *hōba / həbáyt*, Śheri *šōʃ / šbaʃə́t* (Brugnatell 1982: 133–41; Leslau 1987: 482–83; mSAr forms after Johnstone). The Akkadian *s*-form is probably old; only an old *s*- in the numeral "7" can explain the surprising *s* in *samāne* "8" instead of the expected *š*- < **ṯ*-. It seems the difference between the initial syllable **si*- in Akkadian vs. **ša*- in other languages originated as a result of the influence of the preceding numeral "6": the sequence **šid[u]ṯ*- "6", **sabʃ*- "7" caused the change of the root vowel in ESe **sibʃ*-, while in the other Semitic languages the initial consonsant was changed in **šabʃ*-. If this explanation is acceptable, the original root of the Semitic numeral "7" was **sabʃ*-. Se **s*, reflecting AA **c*, is compatible with Eg *s*. But the irregular correspondence between the clusters *-fḫ*- and **-bʃ*- remains unexplained. The following solution can perhaps be plausible: The original form was **sabʃ*- "7" in Egyptian, comparable with the Semitic counterpart. The following numeral is **ḫamān*- or **ḫamūn*- "8" in Egyptian. In the sequence "7".. "8", it is quite legitimate to expect sandhi **sabʃ*- **ḫamV̄n*- > **sabḫ*- **ḫamV̄n*-. One would expect the spirantization **-bḫ*- > **-fḫ*-, but the sequence *-b(-)ḫ*- exists e.g. in *3bḫ* "to mix" or in *sbḫ.t* "a kind of amulet" (DELC 249, 185). It was perhaps some combinatorical change connected with the presence of *-s*-, that operated here, cf. the pair *ḫsf* vs. *ḫsb* "to succeed in protecting" (Edel 1955–64: 51). Vycichl assumes an analogical development in Eg *wsḫ* "to be wide" vs. Ar *wasiʕa* id. (DELC 240). Schenkel 1990: 56 sees regular reflexes of AA **ṗ* in Eg *f* vs. Se **b* (similarly Dolgopolsky 1996, p.c.!); Eg *ḫ* vs. Se **ʃ* have to reflect AA **γ_1 / *γ_2*.

The position of the Berber numeral "7" is more problematic. It is attested in all branches: (E) Ghadames *sā / sāt*; (S) Tahaggart *əssa / əssahät*, Ayr *əṣṣa / əṣṣayät*, Ghat *sa / sahət*, Tawlimidden *sah / sahat*; (W) Zenaga *əššəh / əššddət*; (N) Mzab *sā / sāt*, Semlal *sa / sät*, Tazerwalt *ssä / ssät* etc. and Guanche (Gran Canaria) *satti*, (Tenerife) *sa(t)* (Woelfel 1954: 9–10). Prasse 1969: 89 has reconstructed the consonantal skeleton √h_1sh_2, later he presented the protoform **sāh* with a longer variant **hissāh* (1974: 403, 405). Rössler 1952: 142 explains the loss of **b* through assimilation **-sb*- > **-ss*-, postulating a primary form **asba'u*. But the gemination of the first (second in the Prasse's reconstructions) radical appears in "2", "4", "6", "7", "8"! AA **b* has been sometimes lost in Berber, cf. (S) Taneslemt *ulh*, pl. *ulhawən* "heart", Tawlimidden *ul*, *əwəl* (Prasse 1969: 76); (E) Augila *ul*, Siwa *uli* (Basset); (N) Ntifa *ull* etc.; (W) Zenaga *ud & uǯ*, pl. *ellun* (Basset) < **wilih* ? or **huluh* ? (Prasse 1974: 72). Rössler 1952: 134–35 postulates the following development: **ulh* < **luh* < **lub* < **lubbu*, cf. Eg *ỉb* // Se **libb*- (Fronzaroli), **libw*- (Vycichl) // ECu **lubb*-, etc. The pBe reconstruction **sụḥ* "7" of Zyhlarz (1931: 137) is not well-founded.

A hypothetical cognate can also be found in the Matakam group of CCh: Gwendele & Hurzo *cíbà* "7" (de Colombel) = Hurzo *cíɓà* (Rossing 1978: 322, #621), if it is not a compound of *ciyâw* "2" & the numeral "5" of the type Mora *ídlìbè* (Blažek 1990: 31).

No convincing etymology of the numeral "7" has been proposed so far. The following two solutions can be presented:

(i) A primary semantic motivation based on the meaning "forefinger, index", cf. Ar *sabābat*, *sibbat*, *sabbāḥat* id. (Steingass 1988: 476–77). Perhaps the same biradical nucleus *s-b* appears in the verb *sabaʔa* "to take by hand". Outside Semitic, Somali *saʃab* "palm of hand with fingers" (< **sabʃ-* as *gaʃan* "hand" < **ganʃ-*, see Sasse 1982: 77) and eventually Beja *sibta* "wrist, wrist-joint" (Roper) can be related. There are typological parallels e.g. in Zulu *isikhombisa* "7" and "forefinger" (Hoffmann 1952–53: 72) or Malay *tud'uh* "7" derived from Austronesian **tuZuq* "forefinger", orig. "to point" (Dahl 1981: 50 after Dyen).

(ii) A primary semantic motivation based on the numeral "3", attested in ECh: Mubi *súɓà*, Birgid *súúbù*, Jegu *sup* / *sub*, Migama *súbbà*, Dangla *sûbbà*, Sokora *sùbbá*, Tumak *sûb*, Ndam *sûp*, cf. "Gulei" *cuba* (Lukas 1937: 94), Sumray *súbù*, Lele *sùbù*, Kabalai *sàp*, cf. "Kaba" *sabu* (Lukas 1937: 92), Kera *soope*, Kwang *suupáy* (Jungraithmayr & Ibriszimow 1994, II: 327). A Central Chadic cognate can perhaps be found in Baldamu (Matakam group) *sàabùr* "8" (Seignobos & Tourneux), if it represents the operation "3 + [5]".

The numeral "7" created by "3" is not unusual esp. in Chadic: Sumray (Nachtigal) *dénā súbu* "7" = "three [bent] fingers", cf. *dénā men* "9" (*dénum*, *dunum* = "finger", *mon*, *men* "1") or Ndam (Decorse) *wo subo* "7" = *woro* "4" + *supu* "3" (Blažek 1990: 31).

The etymologies (i) and (ii) may not exclude one another; it is natural if the word * [*c*]*ab-* meant "forefinger" in some dialects and "middle finger" (> "3") in others.

8. Eg **ḫamān-* (cf. the cuneiform transcription *ḫa-ma-an*; see DELC 264) or **ḫamūn-* "8" has been usually compared with a Se counterpart (already Brugsch, cf. Erman 1892: 116; lastly Loprieno 1995: 71). The following forms are attested in Semitic: Ak *samāne* f., As *šamāne* f. / *šamānat* m. (AHw 1017), Ug *ṯmn* / *ṯmnt* = **ṯamānī-* / **ṯamānīt-* (Segert 1984: 53), Ph *śmn(h)* = **šəmōnā*, He *šəmōnɛ̄* / *šəmōnā*, Syriac *təmānē* / *təmānyā*, Ar *ṯamānin* / *ṯamāniyat*, EpSAr *ṯmn(y)* / *ṯmn(y)t*, Geez *samāni* / *samānitu*, *sammantu*, Tigre *säman*, Tigrinya *šommänte*, Amhara, Gurage *səmmənt*, Harari *sūt* (**sumn-t*), Harsusi *ṯəmōni* / *ṯəmənēt*, Mahri *ṯəmōni* / *ṯəmənyēt*, Soqotri *təmóni* / *tə́mənih*, Śheri *ṯūni* / *ṯēnít* (Brugnatelli 1982: 133–41; Leslau 1987: 502; mSAr after Johnstone). The initial **ṯ* (< AA **č*) is incompatible with Eg *ḫ* in spite of the attempt of Albright 1918: 92, proposing the development: *ḫmn* < **šmn* < **ṯmn*. The vacillation *ḫ* ~ *š* is very rare in Egyptian. Edel 1955–64: 53 finds the only example in *iḫ t* "Sache" vs. *išt* with possessive suffixes (Wb. I: 124 & 134). Vycichl 1990: 68 quotes *ḫnš* "to stink" (Wb. III: 301) vs. nEg *mw šnš* "foul water" (Wb. IV: 517). The shift *ḫ* > Coptic ϣ has taken place in all dialects except Ahminic where ϩ is preserved (Vycichl 1990: 68).

The Se numeral "8" was also compared with the Berber counterpart (Rössler 1952: 143), reconstructed as **tām* & **hittām* (Prasse 1974: 405) on

the basis of the following forms: (E) Ghadames *tām / tāmət*; (S) Ghat *tam / tamət*, Tahaggart *əttâm / əttâmāt*; (W) Zenaga *ittəm*; (N) Semlal *t(t)am / tamt*, Tazerwalt *tam / tamt*, Mzab *tam / tamət*, Djerba *attam* etc. and Guanche (Gran Canaria ?) *tamatti* "8" (Woelfel 1954: 10). But the regular correspondent of Se **ɬ* is Be **s* (cf. §2; in spite to Rössler l.c., the response between Se **ɬ* & Be **t* is based only on the unique example of the numeral "8"). From this point of view an only regular cognate to Se "8" appears in a puzzling form *sâm* "8" recorded in Sus (of 'Amiln) by Klingenheben (see Woelfel 1954: 10). Rössler 1966: 228 explains an irregular **t-* instead of an expected **s-* in Berber by alliteration to the following numeral **tiẓāh & *tūẓah* "9".

Besides this phonetically problematic comparison, there is one neglected etymology of the Eg numeral "8", deriving **ḫamV̄n-* "8" quite naturally from **ḫamt-* "3" (Holmer 1966: 35). The same connection is evident for ECu **sizḥeet- / *sizḥent- / *sazḥent-* "8" > Hadiya *sadento*, Sidamo *sette*, Kambatta *hezzetto*, Burji *hidítta* (**ḥizzeet- < *ḥiszeet- < *sizḥeet-*); Somali *siddeed*, Oromo *saddeet*; Gollango *sette*, Tsamakko *sezzen*; Yaaku *siite* (Sasse 1982: 95; Ehret 1990: #14), consisting of **s/šizḥ-* "3" (see above) & the numeral "5" attested in HECu **omut-* > Burji *umútta*, Sidamo *onte*, Kambatta *onto* etc. (Sasse 1982: 184; Haberland & Lamberti 1988: 136–37). It is necessary to emphasize that this solution ("8" = "3" [+ "5"]) excludes the etymology (ii), analyzing the preceding numeral as "7" = "3"[subtracted from "10"], where even a different form of the numeral "3" would be used.

On the other hand, in the Se **ɬamānáy-u(m) / *ɬamānay-át-u(m)* "8", the internal structure is also analyzable. It is tempting to identify the three radicals *ɬ-n-y* of the numeral "2" within four radicals *ɬ-m-n-y* of the numeral "8". The primary shape of the numeral could be a syntagm **ɬāniy-mā* or **ɬanīy-mā* *"the second not" (cf. Ar *mā* "not"; see Blažek 1990: 31) or **ɬāniy-/*ɬanīy-min-*[*ʃaŝar-*] *"the second from [ten]", cf. the ordinal patterns **ɬāmin-* (Arabic, Ethiopic) or **ɬamīn-* (Hebrew, Aramaic) and the preposition **min* "from" (Gray 1934: 71, 74). Let us add that Klimov 1985: 206 admits a connection of the Semitic numeral "8" and Hurrian *tumni* "4"!

Also in the case of the Berber numeral "8" there are alternative solutions:

(i) Semitic borrowing. Besides evident Arabic loans as Tawlimidden *taman* (Basset) or Demnat f. *təmunt* there are biradical forms representing the nucleus *t-m*. Not speaking about the missing third radical, the borrowing could have been realized only from such a Semitic dialect, where the continuant of (AA **č* >) Se **ɬ* was either *ɬ* (Ug, Ar, EpSAr, mSAr) or *t* (Aramaic), but not *š* (Ak, He, Ph, Ethio-Semitic). A similar contact was really possible, probably in Delta, thanks to the massive movement of Semites of Syro-Palestinian region into Egypt, known as Invasion of Hyksoses (after 1700 BC).

(ii) A derivative of one of the original Afroasiatic denotations of the numeral "3" ("8" = "[5]+3"). This point of view can be supported only by South Cushitic data: Iraqw, Burunge, Alagwa *tam*, Qwadza *tami*; ? Dahalo *'ɬɬaanɬóóni* "third day after tomorrow" (Ehret 1980: 290; Blažek 1990: 31).

Besides the common East Cushitic form **lam-* "2" (Sasse 1982: 133) there are rather enigmatic forms with initial *t-* in Konsoid: Mossiya *tammó* (Lamberti) = Bussa *tam*ⁿ (Bender) and Dullay: Dume *tomme* "7" (Conti Rossini) vs. the other Dullay **taḥḥan* "7" < pDullay **tam-ḥan* "2 + 5"? The vacillation between the meanings "3" and "2" ("7") is perhaps explainable by the original "finger"-semantics.

(iii) If Be **tiẓ(ẓ)āh* & **tūẓah* "9" can be derived from **t(V)-[k]ūẓ-* "[5] + 4", it is natural to expect in **tām* "8" analogically **t(V)-[H]am...* "[5] + 3", where the existence of a hypothetical segment **[H]am-* "3" is supported by Guanche *amiat* etc. "3" and Eg **ḫamt-* "3" (see above, n. 3) together with **ḫamV̄n-* "8".

9. Eg **pisíḏ-* "9" (this vocalization is supported by MBa transcription *pi-ši-iṭ*, cf. DELC 248) has again been compared with Semitic and Berber counterparts, in spite of serious phonetic problems (Albright 1918: 92 assumed *psḏ* < **tsḏ* < **tsg* < **tsṅ* < **tsʃ* !; Rössler 1971: 303–04, 307 and Schenkel 1990: 57 explain the irregular change *p* < **t* via dissimilation of *t* against *s* (there is only one item representing the sequence *t-s..*, namely *ts* "a kind of bread", see Wb. V: 388); cf. also Loprieno 1986: 1308 and 1995: 71; on the other hand, Erman 1892: 111 agreed only hesitantly; Zyhlarz 1931: 137 would expect Eg **tsḫ* vs. Se **t-š-ʃ* "7" as *sfḫ* vs. **s-b-ʃ* "7").

Se **tíšʃ-u(m)* f. / **tišʃ-át-u(m)* m. "9" (Dolgopolsky p.c.) continues in Ak *tiše / tišêšê/īt(um)* (AHw 1362), Ug *tšʃ / tšʃt* = **tíšʃ-* / **tišʃat-*, Ph *tšʃ* = **tiš(a ʔ)ʃ-*, He *téšaʃ / tišʃá*, Syriac *təšaʃ / tešʃā*, Ar *tisʃ- / tisʃat-*, EpSAr $ts_1ʃ$ / $ts_1ʃt$, Geez *təsʃu / təsʃatu*, Tigre *səʃ*, Tigrinya *täs/šʃattä*, Soqotri *(t)seʃeh / saḥ* (Leslau 1938: 289), Mahri *sā / sāt*, Harsusi *sē / sāʔáyt*, Śheri *sɔʃ / saʃáyt* (Johnstone) (Brugnatelli 1982: 133–41; Leslau 1987: 580–81; Testen, *BSOAS* 61[1998]: 314–17 assumes for the aberrant mSAr forms the merger **t* + **š* > *s*).

Concerning etymology it is very remarkable that the numeral **tišʃ-* "9" and one of the Semitic numerals "1" **ʃaštay-* (Ak *ištē/īn(um)*, *ištiānum / ištiat*, *ištē/īt(um)* "1", *ištēnšeret*, poet. *ištēnešret*, Ug *ʃšt ʃšr / ʃšt aʃšrh*, He *ʃaštēʃāśār* "11", EpSAr $ʃs_1tn$ "1") differ only in the order of consonants. This fact can represent a key to the etymology. If metathesis served as a way of expression of semantic polarity (cf. the examples collected by Majzel' 1983: 246 as Ar *ǧamīl* "fair, excellent" vs. *lamīǧ* "disfigured, ugly", etc.), it is possible to understand the opposite order of the radicals forming the numeral "9" just as the expression of "absence of one". An alternative possibility can be a radical simplification (haplology ?) of the hypothetical syntagm **ʃaštay-ʃašti/u ʃaśar-* "1 from 10", cf. Ak *išt(um)*, *e/uštu*, nAs *issu* "from, of" (AHw 401) and Eblaite ÁŠ-DU "out from", ÁŠ-TI "from" (Diakonoff 1988: 68 and 1990: 28). It is evident that the Akkadian forms are incompatible with Geez *wəsṭ* "interior", Ar *was(a)ṭ* "middle" for semantic and phonetic reasons.

The following forms of the numeral "9" are attested in Berber: (E) Ghadames *təṣū* m. / *təṣūt* f.; (S) Tahaggart *təẓẓa / təẓẓât*, Ayr *tăẓa / tăẓayăt*,

Tawlimidden *təẓa / təẓayăt*; (W) Zenaga *tuṭăh*; (N) Semlal *tẓa / tẓat*, Tazerwalt *ṭẓẓa / ṭẓẓat*, Mzab *təs / təssət* etc. Rössler (1952: 143) derives it from 'Lybian' **taṣṣa'u* and sees here a cognate to Se **tiš$^{\varsigma}$-*. Prasse (1974: 403, 405) reconstructs pBe **tiẓāh* with a variant **tūẓah* based on Zenaga. In spite of Rössler's categorical refusal "Entlehnung ausgeschlossen", the Semitic origin is quite possible (cf. § 8), esp. when there is no cognate in Guanche. In Guanche two forms of "9" are recorded: (i) *aldamorana* (Gran Canaria), (ii) *acot* (Tenerife). The form (i) consists of *marava* "10", while *alda-* can be identified with Shawiya *ald(a)* "jusque, jusqu'à", hence "9" = "up to 10" (Woelfel 1954: 11). The form (ii) corresponding undoubtedly to *acodetti* "4" recorded at Gran Canaria, represents probably an ellipse from **sumus akot* "5 + 4" or sim., cf. e.g. Beja *aššaDig* "9" = **as(a)-faDig* (Woelfel 1954: 26), where **asa-* is a participle of the verb *as-* "mehr machen" (Reinisch), hence "9" = "adding 4" or sim. The pattern (ii) opens a possibility to interpret the Berber numeral "9" in a similar way: **tūẓah* can be derived from **t(V)-[k]ūẓah* "[5] + 4", cf. **hakkūẓ* "4" (Blažek 1990: 31). The loss of **-k-* has an analogy e.g. in Tahaggart *tēsəmt*, pl. *tēsmīn* "salt" vs. *kusəm* "to be salt", *uksəm* "natron" (Vycichl 1955: 312). The same structure is perhaps also analyzable in the numeral "8" (see #8). The same affixes **tV-...-a(h)* probably form the Zenaga numerals *təšəndi* "20" and *tu karda* "30" (Woelfel 1955: 27; Prasse 1974: 406).

If the preceding arguments are correct, the Semitic and Berber forms of the numeral "9" are not related to the Egyptian counterpart, and even one another probably also not.

It seems that there are no external parallels to Eg **pisḏ-* "9". Sethe 1916: 20 and Loprieno 1986: 1308, 1306, fn. 30 propose an interesting internal etymology, identifying an original meaning "new" in "9". But their arguments cannot be accepted without doubts. The root *psḏ* does not mean "new". There is only *psḏ(n).tyw* "Tag des Neumonds" (Wb. I: 559). The semantic connection "new moon" and "new" is certainly possible, cf. Ug *ḥdṯ* "new moon" vs. Ar *ḥadaṯ* "new", but *psḏ(n).tyw* is evidently a derivative of *psḏ* "leuchten, scheinen" (Wb. I: 556). Sethe and Loprieno also refer to Indo-European **neu̯m* "9", usually derived from **neu̯-* "new". This argument may also not be valid, because the numeral has to be reconstructed with an initial laryngeal **H_1neu̯m*, but the adjective without it. And finally, from the point of view of semantic typology the neglected etymology of Holmer (1966: 37) deriving the Indo-European numeral "9" from the preposition **H_1enu* "without" (Gothic *inu*) looks better. The preposition originates perhaps in a noun "lack". The numeral **H_1neu̯m* can represent its accusative, hence "9" = "in lack" or sim.

The etymology of Eg **pisḏ-* remains open. It can perhaps be derived from *psḏ* "back" (Wb. I: 556), i.e. "9" = "[1] back", or better from the synonymous verb "sich entfernen von", hence "[one] removed (away), [one] moved (back)" ?

10. For semantic reasons Eg **mḏ-* "10" (cf. MBa transcription *mu-ṭu*, see DELC 124) can neither be directly connected with Eg *mḏ* "to be deep" (Sethe

1916: 17) nor with Se *m-d-d* or *m-ṭ-ṭ* "lang ziehen, ausdehnen" (Loprieno 1986: 1316, fn. 33) because of phonetic incompatibility of Eg *ḏ* and Se **d*/**ṭ*.

Brockelmann 1908: 487 compared it with phonetically quite incompatible Se **miʔát-u(m)* "100".

The same can be said concerning the comparison with Se **maʔd-* "many" (Diakonoff 1988: 67) > Ak *mādu*, Ug *mḏ*, He *məʔōd* (**maʔād*, see Segert 1984: 191).

Behnk 1928: 139 connected *mḏw* with Hausa *góómàà* "10". It is in principle possible, if metathesis operated. The Hausa numeral has cognates in all Chadic branches: (West) Iiwam *gmbat*; Dera *gûm*; Tsagu *wúúmà*; Ngizim *gúumà*; (Central) Tera *gwàŋ*; Margi *kùmù*; Paduko *jumą*; Buduma *hā-kán*; Musgu (Röder) *gum*; (East) Mokilko *kòòmá(t)* (Jungraithmayr-Ibriszimow 1994, II: 320–21). But Hoffmann (1970: 12–14) demonstrated the Benue-Congo origin of the Chadic numeral (cf. Benue-Congo **-kumi* "10", see Jungraithmayr-Ibriszimow 1994, I: 165).

It was already Meinhof (1912: 240) who found a possible cognate of *mḏw* in Berber, concretely Tazerwalt *mḍráu* "10". Prasse (1974: 403, 405) reconstructed pBe **marāw* "10", continuing in (E) Ghadames *maraw / marāwet*; (S) Tahaggart *märaw / märawāt*, Ayr *maraw / marawat* etc.; (W) Zenaga *mərəg, məri / mərəgəṯ* ; (N) Semlal *mraw / mrawt*, Demnat *mraw / mərawt*, Mzab *məraw / mərawt* etc. and Guanche (Gran Canaria) *marava*, (Tenerife) *marago* (Woelfel 1954: 12). This comparison was accepted by Zyhlarz (1931: 137 and 1934: 104, 106), speculating about a special correspondence Eg *ḏ* // Be **r*. Vycichl (DELC 124) rejected this comparison just for the difference *ḏ* vs. *r*. He also mentioned that *-w* represents an integral part of the root of the Berber numeral, while in the case of Egyptian it is only a masculine marker. Rössler 1966: 227 modified the comparison, postulating the original forms **m3ḏ.w* for Egyptian and **m-r-ʔ-w* for Berber. The loss of medial *3* is nothing unusual in Egyptian. Edel 1955–64: 58 quotes e.g. *zb* vs. 'normal' *z3b* "jackal". It remains to explain the correspondence of the third radicals in both forms. Rössler l.c. finds a regular correspondent to Eg *ḏ* in unattested Be **ʔ* < **ʕ*. But AA **ʕ* has been preserved in Egyptian (Ember 1930: 32–33; Cohen 1947: 85–90). There is a couple of examples to demonstrate the regularity of the correspondence between Eg *ḏ* and Se **ʕ*: *sḏm* // **s-m-ʕ* "to hear", *nḏm* // **n-ʕ-m* "sweet", *nḏs* "be small" // **n-ʕ-š* "be weak" (Albright 1918: 92, fn. 4; Ember 1930: 111–12), although they are not unambiguous. Perhaps an easier solution could consist in a small modification of the Berber reconstruction in **marāgw* giving **marā(w)w* in majority of the languages vs. **marā(g)g* in Zenaga and Guanche of Tenerife. It is generally accepted that Eg *ḏ* can originate from *g* palatalized before *u* or *i*. On the other hand, in Berber languages there is a regular change **-ww-* > **-gg-* and not vice versa (Prasse 1972: 64–64; Blažek 1998: 164).

Finally, there are promising parallels in East Chadic: Sumrai *mwàj* (Jungraithmayr & Ibriszimow 1994, II: 321) = *moj* (Nachtigal) = *moid* (Adolf

Friedrich) = *moet* (Decorse), Gabri, Dormo *moid* (Adolf Friedrich), Tchiri *mōdo* "10" (Lukas 1937: 74, 87), although it remains to be proved the regularity of the phonetic correspondences. In principle, also pBe **tē-mihḍay*, pl. **tī-muhāḍ* "100" (Prasse 1974: 406) can be related. Eg *ḏ* and Be **ḍ* are compatible if they are continuants of AA **ḉ* or **ĉ* (Militarev 1991: 242).

Recently Takács (1996a: 39–42 and 1996b: 441–48) has found probably the most convincing solution, comparing the Egyptian **mūḏ-* "10" with East Cushitic **mig-/*mug-* "full(ness)", **-mg-* "to fill" > Saho *mig-e* "fullness", *-meg-* "to fill", Afar *mig-i* and *-eng-* (< **-emg-*) id., *mamga & manga* "fulness, abundance", *mango & maggo* "to be many / much", Somali *mug* "multitude, fullness", Jiddu *ammuug-* "to be full", Rendille (Heine) *mig*, pl. *amíge* "strong", Bayso *mig-i* "full", Oromo *mog-a* "fullness", *mij-uu* "full", Konso *immak-*, D'irayta *innak-* "to fill", Yaaku *mok* "many" (Sasse 1979: 25; Haberland & Lamberti 1988: 127), Chadic: Musgu (Krause) *mógwa* "high", (Overweg) *mogó* "long", (Röder) *mógo*, (Rohlfs) *ana-mogó* "big" (*a-na* "it is") and Tumak (Caprille) *māg* "être beaucoup / capable; pouvoir", and perhaps Omotic: Mao of Didessa (Fleming) *muk* "all". It is also tempting to include here the isolated form for "10" in the Central Chadic group Higi (Kraft): Higi Nkafa *mùŋðy*, Higi Futu *mùŋi*, Fali Gili *mùŋ* etc., perhaps from **mu-mg-* (cf. Afar *mamga* "fulness) — see Blažek 1990: 41 and Takács 1996b: 442).

The semantic development is quite natural, cf. Se **ʕaŝar-(at-)* "10" (besides Arabic *ʕašīrat* "association, company, tribe", Sabaic *ʕs₂rt* "nomad group") and Eg *ʕš3* "(to be) numerous; many" (Sethe 1916: 17; Ember 1917: 88).

11. The numeral "20" is not directly preserved, but thanks to the play on words known from the Leiden papyrus it is reconstructible as **ḏwty* (Wb. V: 552). The Coptic data allow to vocalize m. **ḏawátay*, f. **ḏawátat*.

Sethe 1916: 24 derived the numeral from **ḏebʃōtej*, dual of **ḏōbʃet* "set of fingers" = "10", cf. Eg *ḏbʃ* "finger" (similarly Zyhlarz 1931: 137). But the difference *w* vs. *b* is not explained.

Behnk 1928: 141 connected *ḏwt* with Beja *tág^{w}*, *dág^{w}*, pl. *tagúug*, Hadendiwa also *dagúug* "20" (Reinisch). The Beja numeral can be derived from *tagéega* "high" (Reinisch) or compared with East Cushitic data: Saho *tagáa*, pl. *táagoog* "shoulder", common Boni **tàgóg* "lower arm" (Heine). There are also other similar forms for "20" in this area: Oromo *digetam* (Tutschek), *digdama* (Gragg) and Barea (= Nara) *dokuta* (Reinisch), cf. *doko* "1" ? Eg *ḏwt* is compatible with its Beja counterpart only if *ḏwt* could be derived from **ḍḏwt*.

Dolgopolsky 1969: 300 compared Eg "20" with the numeral "2" in the Gonga group of the Omotic family: Kaffa, Anfillo *guttoo*, Mocha *gútto*, Shinasha *gittaa*, but these forms are probably borrowed from Ethio-Semitic, cf. Harari *koʔot gutti* "centre, middle", lit. "the middle of two", *koʔot* "2", Gogot *k^{w}et* "2" etc. (Leslau 1963: 76, 90).

The most convincing solution was proposed by Loprieno (1986: 1309), restoring the numeral in the form **[mu]ḏawátay*, orig. du. f. of **mūḏaw* "10".

The same pattern appears in Se **ʃáŝar-ā* "20", du. of **ʃáŝar-u(m)* "10" (Brockelmann 1908: 490; reconstructions after Dolgopolsky p.c.).

12. In most languages with the decimal system the numerals "30" & "40" have been derived from "3" & "4" respectively. There are a few exceptions, e.g. Turkic ("30", "40"), Russian ("40"), Afar ("40") and also Egyptian. The form *mʃb3* "30" is apparently derived by *m*-prefix (nomen loci or nomen instrumenti) from the root *ʃb3*. Loprieno 1986: 1309 assumes the primary meaning to have been "ausgestattet sein" for *ʃb3* and "Komplettheit" for *mʃb3*.

Albright 1918: 92 and Ember 1930: 33 connect Eg *mʃb3* "30" with He *məʃubbār* "intercalculated". Albright assumes an original semantic motivation based on the lunar calendar. A remarkable support can be found in Djebel Nefusa (Zenatian group of NBe) *uyər* "30", originaly "moon, month" (Woelfel 1954: 31; DELC 108).

13. The numeral "40" is not directly attested. Thanks to the play on words, the form **ḥm..* can be reconstructed (Sethe 1916: 29; Wb. III: 82; DELC 299; Loprieno 1986: 1309). It is supported by CoSB ϩⲙϵ "40". Loprieno l.c. speculates about derivation from *ḥmw* "herstellen" or "kunstfertig sein" (Wb. III: 82f).

14. The numerals **ši[nyu]t* "100" and its dual **ši[nyū]tay* "200" (Loprieno 1995: 71) are probably derived from *šny* "rund sein, umkreisen" (Wb. IV: 489), hence "100" = *"runde [Zahl]" (DELC 254; Loprieno 1986: 1309). It is remarkable to mention the same semantic motivation in Berber: Mzab (Hanoteau) *twinest*, pl. *twinas* "100" vs. Proto-Tuareg **tā-wiynist*, pl. **tī-wuynās* "ring, circle" (Prasse 1974: 53, 133) > Tahaggart *tăwînəst*, pl. *tiwînâs*, Ayr *tawəynəst* (Blažek 1998: 163).

Beja *šee* "100" represents probably a late Egyptian borrowing (Reinisch 1895: 207 adds Ar *šayʃ* "quantitas").

15. Eg **ḫa3* "1 000" < **ḫal* or **ḫar* (DELC 255; Loprieno 1995: 71) was derived by Albright (1918: 92) from the verb *ḫ3y* "messen, wägen" (Wb. III: 223). The sign "lotus" for the numeral "1000" is undoubtedly based on homonymy with *ḫ3* "leaf of lotus" (Wb. III: 218). Albright connects the latter word with Geez *ḫəllat* "cane, reed, papyrus" (Leslau 1987: 261). The verb *ḫ3y* is comparable with Se **ḫ-l-y* "to think, consider, ponder, decide" etc. (Leslau 1987: 262). Takács (1997:217) seeks external parallels in the Bata group of Central Chadic: Nzangi *háarú*, Garwa *háarum* etc. "100" (Strümpell).

16. Eg **ḏ[u]báʃ* "10 000" (vocalized after Callender 1975: 57) is depicted by the sign of a "finger", written *ḏbʃ* (Wb. V: 565). The principle of homonymy was probably used again, but "...Allerdings ist der semantische

Zusammenhang zwischen dem Ideogramm und dessen arithmetischen Bedeutung nicht geklärt" (Loprieno 1986: 1310).

There are remarkable areal parallels in various languages of North Africa: West Chadic: Hausa *dúbuu*, pl. *dubbái* "1000", Ngizim (Schuh) *dəbu*; Central Chadic: Gidar, Nzangi *dúbu*, Mboku *dúbọ*, Hurza-Uzam *dúbu*, Mada *dəbu* (all Mouchet), Gisiga (Lukas) *dubu*; Kotoko: Affade *debbú*, *dubu*, Makeri, Gulfei *dubu*, Kuseri *dibu*, *dúbu*, Shoe *debu*; Saharan: Kanuri (Lukas) *dəvu* (Sölken 1967: 172, 181), Teda-Daza *dubu*; Central Sudanic: Bagirmi *dubu*, Sara *duub-* etc. id. (Skinner 1994: 47) and further perhaps East Cushitic **ḍibb-* "100" (Black 1974: 216; Sasse 1982: 47) > Oromo *ḍíbb-a*, Konso *ḍípp-a*, D'irayta *ḍípp*; Arbore (Hayward) *ḍiib-á*; Highland East Cushitic **ṭibb-e* > Burji *ċibba*, Sidamo, Kambatta, Hadiyya *ṭibbe* etc., although some of these forms can be borrowed from Oromo.

17. Loprieno 1986: 1310 quotes three sets of Semitic comparanda to *ḥfn* "100 000":

(i) Ar *ḥafl* "multitude" (Sethe 1916: 13–14; Albright 1918: 93);

(ii) He *ḥopnayim* "beide hohle Hände"; Ar *ḥafna* "Hohlraum" (Loprieno 1986: 1317, fn. 51);

(iii) Se **ʔálup-* "1 000" (Loprieno 1995: 71). However this comparison seems to be the least probable, both for the semantic difference "100 000" vs. "1 000", and for the incompatibility of *ʔ* vs. *ḥ*.

18. Eg **ḥaḥ* "1 000 000, big number" continues in CoS ϩⲁϩ "multitude, many" (DELC 320). Albright 1918: 93 derived it from the verb *ḥḥy* "to seek" (Wb. III: 151–52), extrapolating the original meaning of the numeral as *"what is sought for (but not attained)" ⇒ "illimitably great".

Conclusion

The preceding analysis allows us to formulate the following results concerning the origin of Egyptian cardinals:

1) For the numerals "1" & "2", there are exact cognates in Berber, "3" is probably related to its counterpart in Guanche, perhaps also in Beja.

2) Among Semitic cardinals a perfect cognate appears only in the case of the numeral "2". The numerals "1" and "6" are comparable with Semitic data on the root level (in the case of "6" a borrowing from Semitic cannot be excluded). The same can be said about "5", if it is derived from "hand", but it is evidently an independent Egyptian innovation.

3) The numeral "4" has a common origin with its counterparts in Beja, East Cushitic, Chadic and probably Omotic.

4) The numeral "7" in Egyptian, Semitic and Berber can represent a common heritage in spite of irregular correspondences explainable by sandhi and combinatorical changes. An alternative solution assumes a borrowing, probably from a Semitic source where a promising internal etymology is possible

("index-finger"). But in this case the questions *Where ? & When ?* must be answered.

5) The numeral "8" cannot be directly connected with its Semitic and Berber counterparts. The most natural etymology is based on the numeral "3" as in East Cushitic languages. A borrowing is not impossible either, but the substitution **ṯ* >> **ḫ* has no analogy among identified Semitic borrowings in Egyptian.

6) The internal etymology of the numeral "9" within Egyptian looks more naturally than the Semitic and Berber parallels, regardless of their genetic or areal character, because the substitution **t-š-.. > *p-s..* is again without any analogy.

7) The numeral "10" is compatible with Berber "10" (accepting the development **mūḏ < *mu3ḏ-*) or with East Chadic "10" and Berber "100" or with East Cushitic **mig-/*mug-* "full(ness)".

The numerals reconstructible for a common Afroasiatic continuum (it means with continuants at least on a root level in three or more branches) are "1", "2", "3", "4", with certain problems "5", perhaps even "10". None of the numerals continue in five or even all six branches. It implies two alternative solutions: (i) These numerals were created only after the separation of the peripheral branches, i.e. Omotic and partly Cushitic and Chadic; (ii) In the Omotic, Cushitic and Chadic branches almost all the originally inherited numerals ("1" — "5" ?) were replaced by borrowings from substratal languages or by local innovations. The answer (ii) looks more probable. If we investigate the semantic field of Afroasiatic numerals from the point of view of Afroasiatic dialectology, the closest set of numerals appears in Berber, followed by Semitic, further by Cushitic (Beja !) and Chadic, and finishing by Omotic. The irregular similarities of the numerals "6"-"9" in Egyptian, Semitic and Berber are more probably caused by areal influences rather than by chance. Their relationship is excluded. Deducing from the hopeful internal etymologies of the Semitic numerals, the diffusion could move from Semitic to Egyptian and Berber. It does not exclude the possibility that in Egyptian and Berber theree were higher numerals of their own. They could have been contaminated, accomodated or almost totally substituted by imported forms.

Abbreviations:

AA Afroasiatic; Ak Akkadian; Ar Arabic; As Assyrian; Ba Babylonian; Be Berber; Bj Beja; Central; Ch Chadic; Co Coptic (A Ahminic, B Bohairic, F Fayyumic, S Sahidic); Cu Cushitic; E East; Eg Egyptian; Ep Epigraphic; Gu Guanche; H Highland; He Hebrew; K Kingdom; L Lowland; M Middle; m modern; n new; N North; O Old; Om Omotic; p proto-; Ph Phoenician; S South; Se Semitic; Ug Ugaritic; W West.

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BERBER NUMERALS

§1. Classification

In recent years the most detailed classifications of Berber languages have been presented by Ajxenval'd (1987), using a structural-typological approach, and by Militarev (see Ajxenval'd & Militarev 1991: 157–59) working with lexicostatistics. Their results are as follows:

1. East Berber branch

Siwa (oasis Siwa in West Egypt), Zurg (oasis Kufra in East Libya), Fezzan (oases Tmessa and El Fodjaha in South Libya), Augila (oasis Djalo in North-East Libya), Sokna (North Libya), Ghadames (oasis Ghadames in West Libya).

2. South Berber (= Tuareg) branch

North group: Tuareg of the oasis Kufra, Tuareg of the oasis Ghadames, Imanghassaten, Uraghen, Ghat, Ahnet (Plateau Muydir); "Tamahaq": Emmidir, Taitoq, Ažžer (Plateau Tassili), Ahaggar; Ayr (Plateau Ayr, Kel Ui, Kel Feruan, Kel Tafidet, Ibabidayan etc.), Tuareg of Borku (Chad), Tuareg of Zinder (Niger), East Tawllemmet (= Iulimidden or Awlemidden; Niger-Mali-Burkina bordeland).

South group: Kel Arokas; "Tamašeq": Heyawa, West Tawllemmet, Takarangat, Tagdhaq (= Ifoghas; Plateau Adrar), Taneslemt; "Tamažeq": Ida u Sak (= Dausak), Ighauilen, Imažoghen (= Iguhadaren).

3. West Berber group

Zenaga (= Taddungiyah; Mauretania — Senegal).

4. North Berber group

4.1 Atlas group:

a) Tašelhait (= Šilha): Tinduft, Ait Umbribed (basin of Dra and Djebel Bani); Izemdaln, Imežžad, Ida u Zikri, Ait Isaffen, Amanus, Ait Mzal, Igliwa, Ait Wazgit etc. (Antiatlas); Tazerwalt, Ait Baamrani, Hawwara, Ida u Semlal, Aštuken, Masst, Tiguga, Seksawa, Ait Wadjes, Ida u Izimmer, Demsira, Ida u Geriun, Demsira (basin of the river Sus); Tuggana, Igedmiun, Ait Immur, Ihahan, Imeghran, Ida u Tanan, Ida u Zikki, Ida u Zal, Ntifa (High Atlas);

b) Tamazight (= Beraber): Ait Messad (region of Demnat); Ait Izdeg, Ait Yahya, Ait Sliman, Ait Khebbaš, etc. (upper river Dades, High Atlas); Ait Sadden, Ait Yusi, Izayan, Ait Sgugu, Ait Mgild, etc. (Middle Atlas); Ait Ndir, Ait Naaman (region of Meknes);

4.2. Zenatiya group:

a) "compact": Ait Seghrušen; Ghmara, Žbala (region of Tanger-Tetuan); Rif: Ait Uriaghel, Ibokkoyen, Ait Tuzin, Temsaman, Ikrayen, Ait Said, Ait

Ittift etc.; Bettiwa; Senhaža; Ait Warain; Beni Iznasen; Beni Snus, Beni bu Said (region of Tlemsen); Matmata, Harawa, Ašaša, Halima, Beni Rašed, Beni Ferah, Gheraba etc. (region Frenda-Warsenis); Beni Menaser; Šenua; Beni Salah, Beni Messaud, Beni Misra (region of the mountain Blida); Šawiya (= Tašawit); East Zenatiyan: Sened, Tmagurt (region Gafsa in Tunis), Djerba (island Djerba); Zrawa, Taužžut, Tamezret, Šnini, Dwiret (South-East Tunis), Zwara;

b) "of oases": Nefusa (Djebel Nefusa, North-West Libya); Righ (Tuggurt), Wargla Mzab (all in East Algeria); Figig (South-East Morocco); Tamentit, Tittaf (Twat); Tit (Tidikelt); Ksurs (Gurara — all the oases are in Central Algeria);

4.3. Kabyle (= Taqbaylit) group: At-Halfun, At-Yiratena, "Zuawa", Iržen, At-Hišema, At-Mangellat etc. (North Algeria).

§2. Data

Table 1: Proto-Berber and South Berber

	Proto-Berber Prasse 1974 m. (/f.)	Tawllemmet Alojaly 1980 m. / f.	Tahaggart Prasse 1974 m. / f.	Taitoq Masqueray 1893 m. / f.	Kel-Ui RB 1883 m.	Ghat RB 1883 m.
1	**yīwăn*	*əyyăn / əyyăt*	*iyăn / iyăt*	*yen / yet*	*ian*	*ian*
2	**sīn / *sinăt*	f. *săṇatăt*	f. *sănât(ăt)*	*sen / senatet*		*sin*
	**hissīn*	m. *əshin*	m. *əssin*		*issin*	
3	**karaḍ*	*kăraḍ /-ăt*	*kăraḍ / kărâḍăt*	*keradh*	*ḳaradh*	*ḳaradh*
4	**hakkūẓ*	*əkkoẓ /-ăt*	*ŏkkoẓ / ŏkkôẓăt*	*okkoẓ*	*okkoz*	*sekkuz* !
5	**sammūs*	*səṃṃos /-ăt*	*səmmus / səmmûsăt*	*semmus /-et*	*sammus*	*sommus*
6	**saḍīs*	*səḍis /-ăt*	*səḍis / səḍîsăt*	*sadhis /-et*	*sadis*	*sadis*
7	**săh*	(*sah/-at* RB)				*sa*
	**hissăh*	*əṣṣa /-yăt*	*əssa / əssâhăt*	*essa / essahet*	*essâ*	
8	**tăm*	(*taman/-et* RB)		*ettam /-et*	*ettam*	*tam*
	**hittăm*	*əttaṃ /-ăt*	*əttâm / əttâmăt*			
9	**tiẓ(ẓ)ăh*	*tăẓa /-yăt*	*təẓẓa / təẓẓâhăt*	*teẓẓa / teẓẓahet*	*tezza*	*teza*
10	**marăw*	*ṃăraw /-ăt*	*măraw / mărawăt*	*maraw / merawet*	*maraw*	*meraw*
20		*săṇat(ăt)*	*sănât*	*senatet*	*essin*	*senat*
		təṃərwen	*təmərwîn*	*temerawin*	*maraw*	*merawin*
100	**tē-mihḍay*	*temeḍ*	*temeḍe*	*timidhi*	*timadhi*	*timedi*
(pl.)	**tī-muhāḍ*	*timaḍ*	*timaḍ*	*timadh*		
1000	**ā-gihīm*		*aǧim*	*adjim*		*ajim*

RB = René Basset

Table 2: East Berber West Berber

	Ghadames Lanfry 1973 m. / f.	Ghadames Motylinski 1904 m. / f.	Zenaga Basset 1909 m. / f.	Zenaga Nicolas 1953 m. / f.
1	*yụụn / yụụt*	*iun / iut*	*iun & né-iun / čuač*	m. *(əy)yu'n^h, nəyu'n^h* f. *č-uwət*
2	*sən / sənet*	*sen / sinnet*	*šinan / šenaneth*	*šənən^h / ča-šənən^h*
3	*kaareḍ / kerḍet*	*karedh / kareṭ*	*karaḍ / karaḍeth*	*kăṛăḏ^h / karāḏəṭ*
4	*aqqụz / aqqụzet*	*aḳḳiz / aḳḳizet*	*akoz*	*akkuṭ^h / akkūḍəṭ*
5	*səmməs / səmməsət*	*semmis*	*šommuš / šomušeth*	*šəmmuš / šəmmūšəṭ*
6	*ṣuz / ṣuḍset*	*çoẓ / çoṭset*	*šodeš / šodešet*	*šuḏəš / šoḍešəṭ*
7	*saa / saat*	*sa / sat*	*iššа / iššadet*	*əššəh / eššă'ḏəṭ*
8	*taam / taamet*	*tam*	*ittem*	*ittəm^h / ittāməṭ*
9	*təṣụụ / təṣụụt*	*teçu / teçut*	*tuza*	*tuṯăh / tuḏāəṭ*
10	*maraw / maraawet*	*meraw / merawt*	*mêrêg / meregeth*	*mərəg^h*, pl. *tmərīn^h*
20			*tešinde*	*taššəndəh*
30			*tukarḍa*	*tukarḏa*
100			*timaḍi*, pl. *temaḍan*	*tẹmăḏih*, pl. *tmuḍa'n^h*

Table 3: North Berber

	Tašelhait of Tazerwalt Stumme 1899 m. / f.	Tašelhait Aspinion 1953 after Penchoen m. / f.	Tašelhait of Semlal Woelfel 1954 m. / f.	Tašelhait of Sus ('Amiln) Klingenheben m.	Tamazight of Demnat Woelfel 1954 m. /f.	Beni Mzab Hanoteau 1860 m. / f.
1	*yăn / yăt*	*yan / yat*	*yan / yăt*	*yẽn*	*yan / yat*	*iggen/igget*
2	*sin / snăt*	*sin / snat*	*sin / snat*	*sĩn*	*sin / senat*	*sen /senet*
3	*krâḍ / krâṭṭ*	*kraḍ / kraṭṭ*	*kṛaḍ / kṛaṭṭ*	*karắt*	*kradh*	*šared/šaret*
4.	*kûz /-t*	*kkuẓ / kkuṣt*	*qquẓ / qquṣt*	*kōs*	*akkoz /-t*	*okkoz /-t*
5	*summus /-t*	*səmmus /-t*	*səmmūs /-t*	*sɪɱmús*	*s(em)mus / semmust*	*semmes /-t*
6	*sddis /-t*	*sḍis /-t*	*sḍis /-t*	*sḍdĩ́š*	*s(ad)dis / saddist*	*sez / sesset*
7	*ssă /-t*	*sa /-t*	*sa / săt*	*sa?*	*sa /-t*	*saa /-t*
8	*tam /-t*	*ttam /-t*	*t(t)am / tamt*	*sắm !*	*tam,tem / tamt,temunt*	*tam /-et*
9	*tẓẓâ /-t*	*ttẓa /-t*	*tẓa /-t*	*cắwuz*	*dza /-t*	*tes / tesset*
10	*mĕrâŭ /-t*	*mraw /-t*	*mraw /-t*	*mɛ̧rắw*	*mraw / merawt*	*meraw /-t*
20	*mĕrâwin*					
100						*twinest*

Table 4: Non-decimal (quinary. ternary, trigesimal) numeral systems

all m.	Mozabi Hanoteau	Ued Ghir Letourner	Djerba R. Basset	Djebel Nefusa Klingenheben		
1	*igguen*	*ighem !*	*iẓẓen*	*udžun*	15	*šaret n ifessen* 3 hands
2	*sen*	*tzem !*	*thin !*	*sen*	20	*okkoz n ifessen* 4 hands
3	*šaredh*	*šaret*	*šaredh*	*šaret*	25	*zegni n uyer d* $^1/_2$ 30 + *sen n ifessen* 2 hands
4	*okkoz*	*occas*	*šaredh d'iẓẓen* 3 + 1	*okkoz*	30	*uyer* month

all m.	Mozabi Hanoteau	Ued Ghir Letourner	Djerba R. Basset	Djebel Nefusa Klingenheben		
5	*fus* hand	*fus*	*afus*	*ufes*	50	*zegni n temiţi* $^1/_2$ 100
6	*fus-igguen*	*fus-ighem*	*afus d'iẓẓen* hand + 1	*ufes d udžun*	60	*sen n yaren* 2 x 30
7	*fus-sen*	*fus-tzem*	(*sebyath* < Arabic)	*ufes d sen*	80	*zegni n temiţi* $^1/_2$ 100 *d uyer* + 30
8	*fus-šaredh*	*fus-šaret*	*attam*	*ufes d šaret*	90	*šaret n yaren* 3 x 30
9	*fus-okkoz*	*fus-occas*	*attam d'iẓẓen* 8 + 1	*ufes d okkoz*	100	*temiţi*
10	*meraw*	*merawn*	*akardaš*	*sen n ifessen*	2 hands	

Klingenheben 1926–27: 44 found traces of the vigesimal system in the dialect of the tribe of Ámiln (region of Sus) based on the Arabic borrowing *ášẹrīn* "20": *ʔāšẹrín zẹ mẹráw* "30" = "20 + 10", *sín izẹ ʔášẹrīn* "40" = "2 x 20", *sín izẹ ʔāšẹrín zẹ mẹráw* "50" = "2 x 20 + 10" etc.

There were at least two or three ancient epigraphic "Libyan" languages related to the Berber language family: East Numidian, West Numidian and Fezzan-Tripolitanian. The best known East Numidian (= "Massilian") language was used in old Numidia (North-East Algeria and North Tunis). Unfortunately, in the known texts from the 2nd cent. BC no numerals are identified.

Besides the "continental" Berber-Libyan languages there are their insular relatives — the languages of the Guanches, aborigines of Canary Islands, definitively assimilated in the 18th cent. The exhaustive information concerning numerals of Guanches was collected by Woelfel 1954:

Table 5: Guanche

	Gran Canaria ?	Tenerife?					
	Niccoloso da Recco		Cedeño de Chil	Marín y Cubas	Berthelot	Pseudo-Sosa	Pseudo-Sosa after Rixo
1	*nait*	1	*ben*	*been*	*been*	*ben*	*ben*
2	*smetti* = **sin-*	2	*lini*	*liin* or *lini*	*lini*	*lini*	*sijn* or *lini*
3	*amelotti*	3	*amiet*	*amiat*	*amiat*	*amiat*	*amiet* or *-at*
4	*acodetti*	4	arba	arba	arba	arba	arba
5	*simusetti*	5	cansa	canza	cansa	cansa	cansa
6	*sesetti*	6	*sumus*	*sumus*	*sumus*	*sumus*	*sumus*
7	*satti*	7	*sat*	*sat*	*sat*	*sát*	*sa* or *sát*
8	*tamatti*	8	*set*	*set*	*set*	*set*	*set*
9	*alda-morana*	9	*acot*	*acot*	*acot*	*acot*	*acot*
10	*marava*	10	*marago*	*marago*	*marago*	*marago*	*marago*
11	*nait-marava*	11	*ben y marago*	*benir marago*	*beni marago*	*benir marago*	*benir marago*
12	*smatta-m.*	12	*lini marago*	*sinir marago*	*lini marago*		
13	*amierat-m.*	20	*limago*	*linago*	*linago*		
14	*acodat-m.*	30	*amiago*	*amiago*	*amiago*		
15	*simusat-m.*	40	arbago	arbago	arbiago		
16	*sesatti-m.*	50	camago	cansago	cansago		
		60	*sumago*				

	Gran Canaria ?	Tenerife?				
	Niccoloso da Recco		Cedeño de Chil	Marín y Cubas	Berthelot	Pseudo-Sosa	Pseudo-Sosa after Rixo
		70	*satago*				
		80	*setago*				
		90	*acotago*				
		100	*bemaraguin*	*bemaraguin*	*beemaragoin*		

Berber-Libyan-Guanche (shortly Berber) languages represent one of the six branches of Afroasiatic macro-family together with Semitic, Egyptian, Cushitic, Omotic and Chadic. Only the Semitic and naturally the Egyptian numerals can be projected on the proto-language level, cf. table 6:

	Proto-Semitic (Dolgopolsky 1995, p.c.)		Proto-Egyptian (Vycichl // Loprieno)	
1	**ʔaḥ(ḥ)ád-u(m)* m.	**ʔaḥ(ḥ)ád-at-u(m)* f.	**wiʃyaw // *wúʃʃuw* m.	**wiʃi.t* f.
2	nom. **t̠in-ā(-ni)*	**t̠in-at-ā(-ni)*	**siny-ū-āy*	**sỉni.t-āy*
	acc.-gen. **t̠in-ay(-ni)*	**t̠in-at-ay(-ni)*		**sinya.t-āy*
3	**ś/t̠alāt̠-u(m)* f.	**ś/t̠alāt̠-át-u(m)* m.	**ḫamtaw*	**ḫamta.t*
4	**ʔarbáʃ-u(m)*	**ʔarbaʃ-át-u(m)*	**ifdaw*	**ifda.t*
5	**ḫamiš-u(m)*	**ḫamiš-át-u(m)*	**dỉwey // *dỉyaw*	**diwi.t*
6	**šid[u]t̠-u(m)*	**šid[u]t̠-át-u(m)*	**si[r]sáw // *sáʔsaw*	**si[r]sa.t*
7	**sábʃ-u(m)*	**sabʃ-át-u(m)*	**safḫaw*	**safḫa.t*
8	**t̠amānáy-u(m)*	**t̠amā nay-át-u(m)*	**ḫamā́/ūnaw*	**ḫamā́/ūna.t*
9	**tišʃ-u(m)*	**tišʃ-át-u(m)*	**pisỉ́daw*	**pisỉ́da.t*
10	**ʃášar-u(m)*	**ʃašar-át-u(m)*	**mū́d̠aw*	**mū́d̠a.t*
20	**ʃášar-ā* = dual of **ʃašar-* "10"		**d̠awā́tay* < **mūd̠awatay* = dual of "10" f.	
30	**ś/t̠alāt̠-ú/ỉ́-ma* = plural of **ś/t̠alāt̠-* "3"		**maʃbVr/l*	
40	etc.		**ḥVmέw*	
50			**diw-ỉy-ū* = plural of "5" // **dỉyyaw* etc.	
100	**miʔát-u(m)* f.		**ši[nyu]t*, cf. dual **šinyūtay* "200"	

§3. Comparative — etymological analysis

1. Berber m./f. **yīw-ăn/-ăt* (Prasse) or **iyyaw-an/-at* (Militarev) and Guanche of Tenerife *be(e)n* < **wayn* (Militarev) represent a participle "being alone, sole, unique" (Prasse 1974: 404) from the root **y-y-w* comparable with Eg *wʃy* "to be alone", *wʃjw/wʃjt* m./f. "1", *wʃʃw* "Alleinsein, solitude, privacy" (Edel 1955/64: 167; Wb. I: 277) and Semitic **w-ʃ-y* > Ar *waʃā* "rassembler, réunir sur un seul point, être guéri (se dit d'un os fracturé dont les éclats se réunissent); to collect, gather", He *yāʃāh* "ramasser, balayer; to sweep together and carry away" (Klein 1987: 261). The correspondence of Be **y* vs. Eg & Se **ʃ* is regular (Vycichl 1991: 383–86). On the other hand, in spite of Zyhlarz (1931: 135), Zavadovskij (1974: 105) and recently Schenkel (1990: 55), Se **w-ḥ-d* (Ak *wēdu* "only, alone, single", Ug *yḥd* "person without kin, an only son", Syrian *īḥīḏā* "only one, unique", He *yāḥīḏ* "only one", Sabaic *k-wḥd* "in unison, together", Ar *waḥīd* "alone, unique", Śheri *šēḥad* = √*w-ḥ-d*, Geez *wāḥəd* "unique, only, one" — see Leslau 1987: 609–10) do not be-

long here. The same root appears probably in Se **ʔaḥ(ḥ)ad-* "1" < **ʔa-wḥad-* (cf. Dombrowski 1991: 344). The most hopeful cognate can be found in Berber: Ghd m./f. *iḍen,-et*, pl. *əḍn-in* "other", *wīḍen* "another" vs. m./f. *wa-/ta-yiḍ*, pl. *wi-/ti-yyiḍ* "some, any", Ahg m./f. *hăḍăn,-ăt*, pl. *hăḍnîn* "other" vs. m./f. *wi-/ti-yoḍ* "some, any" etc. (Prasse 1969: 20, 45 reconstructs $\sqrt{h_2\text{-}h_1\text{-}ḍ}$; cf. further Prasse 1972: 211–15).

The parallelism of Guanche (f.) *nait* (Gran Canaria ?) and Zenaga m. *néiun* is remarkable.

The origin of this "prefix" could be in the genitive construction known e.g. from Ahg *wa n-iyän* "the first", lit. "that who is the first" (Prasse 1974: 407).

The seemingly different forms, like Ued Righ and Šenua f. *išt*, Snus *išts*, *yîšts* etc. (e.g. Zavadovskij 1974: 105 compares these forms with Se **ʕaštiy-(ān-)* "1") are regularly derivable as follows: **yīwăt* > **yīwwăt* > **yīggät* (Mzab, Wargla *igget*, Siwa *iget*) > **yiǯǯət* (Izdeg *iǯt*) > *išt* etc. (Woelfel 1954: 22).

Concerning Guanche (Tenerife ?) *be(e)n* "1" Woelfel 1954: 22 quotes very suggestive parallels from various West African languages: West Atlantic: Wolof *bene*, *wîan*, Temne *p'in*, cf. *tr'ofat win* "11"; Mande: Soninke *bani* etc.; South-Central Niger-Congo: Nupe *wêni*. Is it an accidental similarity or any areal influence ?

2. Be (m.)**sīn* (*& *hissīn*) and Guanche **siyn-/*syin-* (> **ŝin-* > *lin-* ?) "2" correspond perfectly to their counterparts in Se (m.) **ṯin-ā/ay-* and Eg (m.) **siny-ū-āy*, reflecting AA **čin(y)-* "2". The final extension in *-an/-ən* in Zenaga corresponds to the collective of other Berber languages, cf. Ahg m. *əssənən*, Kabyle m. *isnin*, f. *tisnin* "both of them" (Prasse 1974: 408). Projecting the Zenaga "2" in pBe **šināna / *šinānatā*, Rössler 1952: 142 interprets the (unattested) termination as dual and compares it with Ak *šanānu(m)* "gleichen, gleichkommen mit" (AHw 1161; Leslau 1987: 504–05 has collected the other cognates as Syrian *šayyen* "to pacify", Geez *sən?* "peace, agreement", Tigre *(tə)sana* "to be friends", indicating pSe **š* and not **ṯ* as in the case of the numeral "2"). On the other hand, Zavadovskij 1980: 143 tries to prove the relationship of the numeral "2" in Berber, Egyptian & Semitic and the AA word "brother": Eg *sn* "brother, companion, boy-friend" (**sāniyaw* — see Vycichl 1983: 190) // Beja *san*; Awngi *sén* (but Bilin *dan*, pl. *šan* etc.) // ECh: Kera *seenə*, Mubi *sìn*, Migama *sín*, Jegu *šin* etc. "brother" (cf. Rössler 1979: 24). But this common AA isogloss "brother" agrees semantically better with the Se root *š-n-y/ʔ* "to be equal, be in agreement" than with the numeral "2".

Further attempts to find relatives in other branches are no more convincing: Dolgopolsky 1973: 111 followed by Diakonoff 1988: 67 seek parallels also in Central Cushitic (=Agaw) and South Cushitic. But it was already Reinisch 1887: 306 who recognized an Ethio-Semitic borrowing in Bilin, Qwara & Dembea *səna* "Gleichniss, Ebenbild, Art; (gleich)wie", cf. Geez *sənʔ(ā)*

"peace, agreement, harmony; like-minded", *sənʃəw* "equal, agreeing" etc. (Leslau 1987: 504–05). Iraqw *dangi* "twins" together with related Alagwa *irangayo* "twin", reflects SCu **ʔidaŋ-* (cf. Ehret 1980: 166), a form undoubtedly incompatible with AA **čin(y)-* "2". A more hopeful cognate for SCu can be found in WCh **ǯanV* "twins" > Angas & Ankwe *ǯan*; Ša (Ron group) *ǯân* 'suppletive plural to *'awúllàwúl* "twin" (Stolbova 1987: 195, # 465).

3.1. The only attempt to etymologize the Berber numeral **karāḍ* "3" on the basis of the Berber data was proposed by Zyhlarz 1950: 407–08. He interpreted it as "der Kratzer", cf. Tuareg *əkrəḍ*, Tašelhait *kṛḍ* etc. "to scratch", assuming that the original semantic development was "scratch-finger" > "middle-finger" > "third". Let us add that e.g. Fay 1910: 416 admited the same semantic motivation for the Indo-European numeral **tri-* "3", namely "rubbing/scratching [finger]" > "middle finger" > "third", cf. Latin *tritus* "rubbed", although he preferred the primary semantic motivation to have been "protruding [finger]".

Jungraithmayr seeks external parallels in West & Central Chadic: Hausa *úkù*, Sura *kún*, Bolewa *kunum*, Jimbin *kə̀ndí*, Geji *me-kan*, Ngizim *kwán*; Tera *kúnú*, Bata *mwa-kʌn*, Lamang *xkə́ná*, Glavda *xkə̀rda*, Sukur *máá-kʰə̀n*, Gisiga *maa-kar*, Daba *mə̀-kaaɗ*, Gidar *hóó-kuu*, Yedina *kaa-kénne*, Musgu *hu*, Zima-Batna *híndzìʔì* and within East Chadic isolated Mokilko cardinal *ʔáɗó* & ordinal *káɗùwé* (Jungraithmayr & Ibriszimow 1994/I:168 and II: 326; Lukas 1977: 211). But with the exception of Mokilko, this numeral has to be reconstructed only with medial **-n-*, regularly giving *-r-* in some Central Chadic languages (Newman 1977: 17, 18; Jungraithmayr & Ibriszimow 1994/I: XXIII), probably **kanu(-di)* > **kunu(-di)* or **kwan(-di)* > **kwardi* > **kwaɗi* or sim. The facultative extension in **-di* perhaps represents a numerative, cf. Kotoko **di* "thing" > Yedina, Logone *di*, Ngala *ndi* id., Affade *di-pal* "the first" vs. *pal* "one". It is apparently also added to the Chadic numeral "4", reconstructible in the form **faru-di* or sim. (> **fuardi* > **fwaɗi* etc. ?). Among the Chadic forms of the numeral "3", only one hypothetical cognate to the Berber counterpart remains, namely Mokilko *ʔáɗó* "3" & *káɗùwé* "3rd", derivable from **karɗ-*. In Mokilko and generally East Chadic the change **-n-* > *-r-* does not operate. In principle, the unique Mokilko form could be of Central Chadic origin, cf. Glavda *xkə̀rda* or Daba *mə̀-kaaɗ*. But these languages are not neighbors — today their distance is around 500 km — and in the area between them, the various different languages are spoken, incl. non-Chadic ones. The distance of the closest Berbers — Tuaregs of Borku in North Chad representing the second potential source — is still greater.

The attempt of Zavadovskij (1974: 107) to compare Berber "3" (**ḥṛṭ* in his "reconstruction") with Se "**t ɬ ṯ*", Eg "*ḥmt*" and Chadic "*kw(t)*", does not respect any known phonetic law and must be rejected.

3.2. Among the Guanche forms for "3", esp. those from Tenerife (*amiat, amiet*) resemble the Egyptian counterpart **ḫamt-*. Eg *ḫ* corresponds regularly

to Be *γ (Zyhlarz 1934: 113), cf. e.g. Kbl *γuṛ* "chez" and/or *γeṛ* "vers", Tamazight (Ait Ndhir) *γər*, (before pronoun) *γur* "to, toward", Ahg *γur*, Ghd *ɛūr* "chez" (Prasse 1972: 229) vs. Eg *ḫr* "bei, von, zu" (Wb. 3: 315–16; Edel 1955/64: 2). Another correspondent can be Berber *ḫ (sometimes an allophone of *γ), cf. Tuareg *éḫělbes* "papillon" vs. Eg *ḫnms & ḫnws* "moustique" (Wb. 3: 295, 290; Vycichl 1983: 260–61). Militarev (Ajxenval'd & Militarev 1991: 167–68) demonstrated that Be *γ / *ḫ corresponds to Guanche *j* [= *x*], *x*, *ch*, *h*, *g* (probably only orthographic variants of the same sound of the type *ḫ*) and also ∅. Earlier Meinhof (1912: 233) and (Zyhlarz 1931: 136) had compared the Egyptian numeral "3" with Beja (North Cushitic) *maháy* (Halenga), *emhay* (Bišarin). It is possible only if metathesis from **hamay* is acceptable, perhaps caused by alliteration with the preceding numeral *mhaloo-* "2" (Hudson).

Later Zyhlarz (1950: 407) changed his adroit etymology and presented a new proto-Guanche reconstruction **amelʾhǫḍ* based on the forms with medial liquid *amelotti* "3", *amierat marava* "13" (Gran Canaria ?). He interpreted this compound as *"der anderer Zeiger" = "Mittelfinger", cf. Ahg *amel* "indiquer", Kbl *məl* "montrer" and Ahg *hăḍăn,-ät* "other" (see above). Let us mention that Stumme 1899: 207 derived the North Berber name of the index (Šlh of Tazerwalt *mällaγ*, Ait Ahmet *mulleγ*, Tlit *mellaḫ* etc.) just from the verb "to show, point" (Tazerwalt habitative *m(m)äl*). Laoust 1920: 118, fn. 5 asked how to explain the final radical *γ* and suggested a more convincing solution based on the verb "to lick" (Tazerwalt *lluγ*, Ahg, Siwa *əlləγ*), hence "index" = "lick-finger", cf. Greek *λιχανός* or Lithuanian *ližius* id.

4. Zyhlarz 1950: 408 proposed an archetype **aĝ∪koẓ* "4", deriving it from a hypothetical **awu-kúsur* "son of ring", hence "ring-finger". The first component is postulated on the basis of Libyan *w*; Ahg *ăw*, *ăgg*, Šlh *yu*, *yiwi*, Ghd *ụgg*, *ụ*, *awa* etc. "son" (Prasse 1972: 158 and 1974: 270 **ā-wihih*, a derivative of the verb "to give birth", e.g. in Ahg *iwi* < √*whh*, Ayr *əhəw* < √*hhw*). But Zyhlarz did not quote any evidence for his "ring" and that is why his etymology remains very problematic.

Zavadovskij 1974: 110 saw the source of the numeral "4" in the word "finger" attested in Djebel Nefusa *tukoḍ*, pl. *itukoḍ* (Laoust 1920: 118), cf. Nefusi of Fassato *tuqqåḍ* & *tukkåd* (Beguinot 1942: 230). The root of the type **-kVḍ-* is really compatible with **(ha-)kkūẓ* "4", cf. Prasse (1972: 111), quoting the Ahg doublet *tâḍəft // tâẓəft* "hache" or Militarev (in Militarev & Stolbova 1990: 48 and Ajxenval'd & Militarev 1991: 239, 242), who concluded that both **ḍ* and **ẓ* can represent continuants of both AA **ç̣* and **ĉ̣* . But other cognates demonstrate that the original protofom was more complex: Ghadames *aḍəkkəd*, pl. *ḍuḍān* (Lanfry 1973: 81), Augila *táqt*, pl. *taqqîd(ẹn)* (Paradisi 1960: 165), Zenaga *aḍaγḍi*, pl. *ḍuγḍan* (Basset 1909: 105, 221) = *əďăγdi* (Nicolas 1953: 96). In the other forms, the difference between sg. and pl. was eliminated, e.g. Šlh of Tazerwalt *aḍåḍ*, pl. *iḍuḍån* (Stumme 1899: 157), Siwa *ṭāḍ*, pl. *iṭūḍān* (Laoust 1932: 227), Ahg *aḍaḍ*, pl. *iḍəḍwân* < **ā-ḍihāḍ /*

**ī-ḍuḍwān* (Prasse 1974: 185; Laoust (1920: 118) recorded the plural form *iḍūbḍân* in Zemmur (Morocco), where **-ḍw-* > *-bḍ-*). It is evident that any direct derivation of the numeral "4" from the "finger(s)" is not convincing, although semantically fully acceptable.

Another purely Berber etymology can be based on Zayan *aḵeẓẓiẓ* "une poignée de, un peu de" (Loubignac 1924: 553). In this case the primary meaning of the Berber numeral "4" would be "rather small quantity" or sim. So the semantic motivation is comparable e.g. with Anatolian **meyu-* "4", a derivative of Indo-European **mey-* "small, little", cf. Tocharian B *maiwe* "small, young" (Heubeck, Sprache 9[1963]: 201f).

Blažek 1990: 39 proposed a comparison of Be **(ha-)kkūẓ* "4" and West Chadic **kuçV* "9" (Stolbova 1987: 208), reconstructed on the basis of North Bauči **kuçiwa* (Siri *bu-kəçuwi*, Warji, Kariya *kuciya*, Miya *kučiya*, Mburku *kuča* — see Skinner 1977: 33) and Ngizim *kúdkûvdà* (Schuh 1981: 97). Esp. the latter form indicates an old compound with the second component identical with *vàad* "5" < West Chadic **(bV-)baçu* "5" (Stolbova 1987: 151). If we accept this idea, it is natural to identify the meaning "4" in the first component *kúd-*...

The attempts to connect Berber "4" with its counterparts in other AA branches (Egyptian **ifdaw/at*; Chadic **faru(-di)*; Cushitic: Beja **fa[rd]ig*, East Cushitic **ʔaf(f)ar- // *ʔaf(f)ur-*) based on erroneous Berber reconstructions, such as **wuẓ* < **fwuẓ/ḍ* (Zavadovskij 1974: 110) or **ʔfẓ* (Jungraithmayr & Ibriszimow 1994/I: 73) are not acceptable.

On the other hand, there are remarkably similar forms in some Nilo-Saharan languages, esp. in the Tama group (Chad-Sudan borderland): Tama, Sungor *kús*, Erenga *kús / kuz*, Miisiiri *kus / kuz* etc. (Edgar), Nyima (Nuba mountains in Central Sudan) *kudu* "4" (Meinhof). If these resemblances are not only accidental (and their genetic relationship across families is absurd), it remains to admit a direct contact, perhaps anywhere in North Sudan. This conclusion could support the well-known evidence of the presence of Berber-Libyan borrowings in Nile-Nubian.

5. Berber-Guanche **sammūs(-t)* "5" was compared with Semitic **ḫamíš-/*ḫamiš-át-* id. (Zavadovskij 1974: 108; Prasse 1974: 405 mentions Geez *ḫamus* "five days" with a similar internal structure; formally still closer is *ḫəmmus* "fivefold"). The only hopeful reason for the difference Be **s* vs. Se **ḫ* seems to be an alliteration to the following numerals "6" and "7" in Berber with initial **s-*, a phenomenon so typical for numerals (Diakonoff 1988: 67). This irregularity could indicate rather a borrowing than a genetic unity. On the other hand, the etymology of the Semitic numeral "5" is also unclear. Diakonoff 1988: 67 tries to etymologize the Semitic numeral "5" on the basis of Arabic *ḫamīs-* "troop, group" (Steingass 1988: 341 translates it more correctly as "army consisting of five parts", hence the derivative of "five") and Ak *ḫamāšu* "to flex, crook hand or foot" (in AHw 315 it is translated "abknicken" and compared with Ar *ḫamaša*

"to scratch, wound with the claws or nails" indicating the Se root **ḫ-m-ŝ* with the third radical different from -š- in the numeral "5").

Let us add that the Semitic numeral "5" penetrated at least in a part of Berber language territory. Vycichl (1951: 201–02) mentions Kbl (after Huyghe) *aḫěnšim* "fist", comparing it with his record *aḫušim* id. On the basis of final *-im*, he concludes that the word can represent a Punic borrowing. Vycichl is probably right concerning the Canaanean Semitic provenance of the hypothetical source. But in Phoenician / Punic, in the same way as in Hebrew, the proto-Semitic **ḫ* and **ḥ* have merged in *ḥ* . It means we have to seek the source in Semitic language preserving **ḫ*. A good candidate could be a language of the type Ugaritic, where *ḫmš* is attested, while Punic knows *ḥmš* and later even *ʕmš* "5".

Zyhlarz (1931: 137) admits that the etymology of the Berber numeral is unclear. Later he reconstructs a Punic source in the (unattested and rather artificial) form **sūʔʔumuś* "Aufhebung des Fünftels (des Hand)", representing a compound of Punic *nšʔ* "to carry; lift" and *ḥmš*, *ʕmš* "5" (Tomback 1978: 107, 221).

So far nobody tried to etymologize the Berber "5" on the basis of purely Berber data, although it is fully legitimate. So Prasse 1974: 406 thought that the parallelism to the Semitic counterparts and their derivatives indicates their verbal origin and saw in them participles or verbal adjectives (cf. ibid. 210f). A possible verbal candidate could be the *s*-causative of the root √*m-s* attested in Ghadames *məssu* "toucher" (Lanfry 1973: 218). Another solution might be based on a compound of the preposition known from Ahg *əs* "with, after, beyond, through, by, to", Šlh (of Tazerwalt) *s* "after, to, by, through" etc. & pBe **hammās* "centre, middle, interior" (Prasse 1972: 234) > Ghd, Šlh *ammas*, Ahg *âmmas* etc. id., cf. Sened *gemmes* "in the middle, between; half" with a frozen preposition *g* "in" (Provotelle 1911: 109, 113, 123). The semantic motivation can be illustrated on examples of a couple of Papuan languages of Huon family: Kinalakna *holi nembat*, Kumukio *suli nembat*, Selepet *bot nombot* "5", literally "hand(s)-half", Nabak *bet nambet delang*, lit. "hand-half-finished" (Smith 1988: 81–83). Could the Papuan typological parallels indicate a hypothetical syntagm (in Ahg) **əs-âmmas ən-ifassän* "to the half of hands"?

Alternative external parallels can be found in Central Chadic (Blažek 1990: 40): Gidar *še*, Glavda *ŝəm* (Kraft *thləm*), Paduko *zama* (Lukas), Mafa *zlam* (Kraft), Gisiga *dlom* (Lukas), Musgu *šem* (Decorse) = *ŝim* (Müller), Munjuk *slím* (Seignobos & Tourneaux) etc., Kotoko **ŝansi* > Yedina *sinjí* (Lukas), Kuri *šinʒi* (Decorse), Logone *šeeší* (Lukas), Affade & Gulfei *ṣensi* (Lebeuf), Ngala *ki-šenši* (Migeod), Makeri *ṣyensi* (Lebeuf), Kuseri *sasi* (Decorse) etc. (cf. Jungraithmayr & Shimizu 1994/II: 143). The initial lateral sibilant corresponds regularly to *s-* in the West & East Chadic plus Masa group of Central Chadic (Jungraithmayr & Ibriszimow 1994/I: XXVI-XXVII use the symbol **s*$_3$; Newman 1977: 10, 16 reconstructs **ʂ*).

6. North & South Berber **saḍīs* besides North Berber **saddīs* and East & West Berber **sūḍas* or **sūḍus* (Prasse 1974: 405) resemble Semitic **šid[u]ṯ-*, Egyptian **sirsáw* (Vycichl) or **sársaw* (Loprieno) and some Chadic counterparts: (W) Hausa *shíd(d)à*, Gwandara *šida*; Tsagu (North Bauči) *šīcə*; Ngizim *sedu* (Koelle) = *zì dù* (Schuh), Bade *əzdù* (Kraft) (Stolbova 1987: 176 reconstructs WCh **šidu)*; (E) Kwang *sidee*, Mokilko *zót* (both Lukas) = *zóo(t)* (Jungraithmayr). Greenberg 1963: 62, #66 adds CCh cognates: Gidar *serré* (Strümpell) = *širre* (Mouchet), Musgu *saara* (Decorse) = *ŝaara* (Krause), Munjuk *slàarà* (Seignobos & Tourneux), Mbara *łtrá* (Tourneux) etc. The initial lateral sibilant represents a regular Central Chadic innovation corresponding to pCh **s* (see §3.5). The medial *-r-* is derivable from **-d-*, cf. Gidar *biryạ*, Mbara *fré* "monkey" < pCh **bədi* (Newman 1977: 29, #85; Jungraithmayr & Ibriszimow 1994/II: 236–37) // Ahg *abiddaw*, Ghd *biddụ* id.

The correspondence of Be **-ḍ-* (~ **-dd-*) // Ch **-d(d)-* // Eg **-r-* // Se **-d-* is not regular. The Be emphatic **-ḍ-* can be perhaps derived from the geminate **-dd-* preserved in some North Berber languages. The form **saddīs* is really compatible with the Semitic counterpart in a genetic plan. The eventual borrowing opens a question of determination of the hypothetical Semitic source. Its West Semitic provenance is perhaps excluded, cf. Phoenician m./f. *śś / śišt*, He *šeš / šiššā*, Ugaritic *ṯ ṯ (t)*, ord. *ṯḏṯ*. The closest parallels appear in Ar ord. *sādis* and in Ethio-Semitic: Geez *səds* "6" (genus communis), *səddus* "sixfold", Harari *siddisti* "6". The most natural solution may be that it is a borrowing from Arabic introduced during the expansion of Islam in North Africa in the end of 7th and the beginning of 8th cent. It implies the same origin for the Guanche forms (Tenerife *set* "8", orig. perhaps "6" vs. Ar *sitt/-at* "6"; but Gran Canaria *sesseti* resembles rather Berber forms, e.g. Mzab f. *səssət*).

In contrast to Berber, the Semitic numeral is etymologizable within Semitic. There are two alternative reconstructions: (i) **šidš-*; (ii) **šidṯ-*. (i) The form **šidš-* (the variant **šidṯ-* can be a consequence of dissimilation) allows to assume an apocopy from a fully reduplicated stem **šidšid-*. Did it mean the sum "3 + 3" ? Cf. Ug *ṯlṯt w ṯlṯt* "6" = "3 + 3". (ii) If the final **-ṯ-* was apocopated from the numeral **ṯin-* "2", the hypothetical original form **šid-ṯin-* could reflect the multiplication "3x2". Cf. Ngala (Kotoko group of Central Chadic) *kingi ti kisang* "6" = "3" (*kingi*) x "2" (*kisang*). Both solutions identify the meaning "3" in the root **šid-*. Is there any support for this premise? Yes. A hopeful evidence can be found in the Akkadian length measure *šīzum*, *šizû* "Drittel-Elle", *šizât* = $^1/_3$ *uṭṭat* (*uṭṭat* = "wheat") (AHw 1254). But Ak *z* reflects Se **z* or **ḏ*. The latter possibility is probably compatible with both (i) and (ii), i.e. (i) **šiḏšiḏ-* > **šidš[id]-*, and (ii) **šiḏ-ṯin-* > **šidṯ-* > **šidṯ-* (incompatibility of **ḏ* and **ṯ*). The Akkadian word can be projected in pSe **šiḏC-u(m)*, where *C = w, y, ʔ, h, ḥ,ʕ,ġ* . Only for the combination **šiḏḥ-* there is an external evidence, concretely in East Cushitic **šizḥ-/*šazḥ-/*saziḥ-* "3" > Afar *sidoḥ*, gen. *sidiiḥa*, Saho *ʕadoḥ* (< **aszVḥ*), Somali (Isaq) *saddeḥ*, (Benadir) *siddáḥ*, Jiddu

seye, Rendille *séyyaḥ*, Bayso *seedi*, Oromo (Wellega) *sadii*, Konso *sessaa*, Arbore *seezzzé*, Elmolo *séepe* (*-p-* < **-w-* < **-y-* < **-z-*), Dasenech *seddi*, Dobase *siséḥ*, Tsamakko *zeeḥ*, Sidamo *sase*, Burji *fadiya* (*f-* after *foola* "4") (Sasse 1976: 138; Zaborski 1987: 331–42). Let us add that the hypothetical Semitic root **šid-/*šiḏ-* "3" is also comparable with Elamite (eastern neighbor of Akkadian) *zi-ti* "3" (Hinz & Koch 1987: 1305).

Rössler (1966: 221) has demonstrated that Egyptian **r* substitutes Semitic **d* in Egyptian transcriptions of Semitic proper names. It could also indicate a Semitic origin of the Egyptian numeral "6". There is an alternative solution consisting in a comparison of Eg **sirs-* (or **sars-* after Loprieno) with Se **ṯalāṯ-* "3". Phonetically it is fully acceptable and the semantic difference "6" vs. "3" is not invincible either.

The Chadic forms can also be explained independently. In Bade (WCh) Kraft quotes *ɔ̀zdù* "6". But Koelle has recorded *badṣ ŏdi* "6" = *bằdu* "5" + *gáde* "1". Similarly in Karekare (WCh, Bole group) *bɔ̀codi* "6" = *bɔ̀dì-*siwɔ̀di* "5 + 1", *bɔ̀cibèlu* = "5 + 2", cf. *bèlu* "2" (Kraft). The hypothetical conjunction **sV* appears e.g. in Hausa *(goma) sha ɗaya* "11", *(goma) sha biyu* "12", lit. "(10) plus 1", "(10) plus 2" resp. The same pattern is recognizable in East Chadic: Migama *bízgídì* "6" = *béeɗyá* "5" + *káɗyì* "1" (Jungraithmayr) or Dangla *bídígéɗy* "6" = *béɛ́ɗy* "5" + *kèeɗy* "1" (Lukas).

7. For the Berber numeral "7", Prasse 1969: 89 reconstructs a skeleton $\sqrt{h_1sh_2}$. Later he presents the protoform **sāh/-at* (and the longer variant **hissāh/-at*) compatible also with Guanche *satti* (Gran Canaria ?) & *sa(t)* (Tenerife ?). Comparing it with Se **sabʃ-(at-)* "7", Rössler 1952: 142 explains the loss of **b* through assimilation **-sb-* > **-ss-*, postulating a primary form **asbaʔu*. Perhaps a more probable solution consists in a specific development of the cluster **-bʃ-*. In certain conditions AA **b* is changed into *h/∅* in Berber, cf. e.g. the word "heart" reconstructed as $\sqrt{h_1lh_3}$ / $\sqrt{wlh_3}$ (Prasse 1969: 27, 76–77) = **huluh* or **wilih* (Prasse 1974: 72) > Taneslemt *ulh*, pl. *ulhawen*, Tawlimidden *ul*, *əwəl*, Augila *ul*, Siwa *uli*, Ntifa *ull*, Zenaga *uǯ*, pl. *ellun* etc. Rössler 1952: 134–35 assumed the following development: **ulh* < **luh* < **lub* < **lubbu*, cf. Eg *ỉb* // Se **libb-* (Fronzarolli) = **libw-* (Vycichl) // ECu **lubb-* etc. On the other hand, AA **ʃ* gives regularly *y/∅* in the Berber languages (Vycichl 1991: 383–86). These phonetic laws can probably explain the vacillation *h/y* between Ahg f. *əssahăt* vs. Ayr f. *əṣṣayăt* (cf. Prasse 1969: 19).

In Semitic the numeral "7" cannot be reconstructed without problems. Ak m./f. *sebe*, *seba / sebet(tu)* "7", *sebiat*, *se/abat*, *sebītum* "Siebentel" reflect pSe **sibʃ-* (but OAs *šabe* !), He *šéḇa / šiḇʕā*, Aramaic *šəḇaʕ / šiḇʕâ* reflect pSe **šibʃ-* and finally OAs *šabe*, Ar *sabʕ- / sabʕat-*, Geez *sabʕ(u) / sabʕattu* reflect pSe **šabʃ-*. The Akkadian *s*-form is probably primary; only old **s-* in the numeral "7" can explain the surprising *s* in Ak *samāne* "8" instead of expected *š* attested in As *šamāne* < **ṯ* . The difference among initial syllables **si-/*ši-/*ša-* could consist in the mutual influence of the numerals **šid(V)šṯ-* "6",

**sabʕ-* "7", **ṯamānay-* "8" (> Canaanean **š-*). In spite of this uncertainty in reconstruction there is a hopeful properly Semitic etymology based on the word for "index(-finger)" attested in Ar *sabābat, sibbat, sabbāḥat* (Steingass 1988: 476–77). Perhaps the same biradical nucleus *s-b* appears in the verb *sabaʔa* "to take by hand". Outside Semitic a promising cognate appears in Somali *saʕab* "palm of hand with fingers" (< **sabʕ-* as *gaʕan* "hand" < **ganʕ-*, see Sasse 1982: 77). The semantic motivation "index" > "seven" is not isolated, cf. Zulu *isikhombisa* "7" and "index" (Hoffmann 1952–53: 72) or Malay *tuďuh* "7", a derivative of Austronesian **tuZuq* "index", orig. "to point" (Dahl 1981: 50).

Eg **safḫ-* corresponds unambiguously to its Semitic counterpart. In the final position we would expects ʕ. This irregular change could be caused by sandhi **sabʕ- *ḫamV̄n-* > **sabḫ- *ḫamV̄n-*. It remains to explain why there is *f* instead of **b*. One would expect spirantization **-bḫ-* > **-fḫ-*, but the sequence *-b(-)ḫ-* exists e.g. in *3bḫ* "to mix" or in *sbḫ.t* "a kind of amulet" (Vycichl 1983: 249, 185). Some combinatorical change connected with the presence of *s* has perhaps operated here, cf. the pair *ḫsf* vs. *ḫsb* "to succed in protecting" (Edel 1955–64: 51). Vycichl 1983: 240 mentions an analogical development in Eg *wsḫ* "to be wide" vs. Ar *wasiʕa* id.

Hypothetical cognates can also be found in the Matakam group of Central Chadic: Gwendele & Hurzo *cíbà* "7" (de Colombel) = Hurzo *cíɓà* (Rossing 1978: 322, #621).

8. Be **tām* (& **hittām*) and Guanche *tamatti* (Gran Canaria ?) "8" resemble suggestively Se **ṯamānay(-at-)* id. But in spite of Rössler (1952: 143) and Militarev (Militarev & Stolbova 1990: 48; Ajxenval'd & Militarev 1991: 242), the regular correspondence of AA **č* > Se **ṯ* is Be **s*. The only example supporting also Be **t* as a continuant of AA **č* is just the "eight"-etymology. On the other hand, there is at least one form with expected *s-*, namely *sām*, recorded by Klingenheben (1926–27: 44) in the area of the tribe 'Ámiln of Sus, which agrees with the phonetic law quoted above. It is possible to imagine the origin of the *t*-forms thanks to an alliteration to the following numeral **tiẓāh // *tūẓah* "9". But there is an easier explanation of the unique *s-* appearing only in one idiom, namely an alliteration to the preceding numerals "5", "6", "7", all with initial **s-*.

It means that it is necessary to look for another solution. Most natural is to presume a Semitic origin. There are evident Arabic loans preserving the third radical *-n-*, e.g. Tawlimidden m. *taman* (Basset) or Demnat f. *təmunt* "8". The other only biradical forms are probably older. The eventual borrowing should be realized from such a Semitic source, where the continuant of Se **ṯ* was either an interdental spirant **ṯ* (Ugaritic, Arabic, Epigraphic South Arabian, Modern South Arabian) or *t* (Aramaic), but not *š* (Akkadian, Hebrew, Phoenician/Punic, Ethio-Semitic). Besides Arabic appearing in North Africa from the end of the 7th cent. AD, only Epigraphic South Arabian or Ugaritic can probably be taken in account. In the latter case for its possible presence in the Delta

thanks to the movement of "Hyksoses" from the 18th cent. BC. In the first case there were rich commercial connections between Arabia and North Africa for a long time before the Muslim expansion. It can be documented by the evident influence of South and North Arabian scripts on the Libyan and modern Tifinagh scripts and on the system of figures preserved in Ghadames (Littman 1904 — see Ajxenval'd & Militarev 1991: 160; Vycichl 1952: 81–83).

If **karāḍ* "3" is an innovation limited only to Berber (the Mokilko parallel can be a Central Chadic or even Berber borrowing) and the Guanche counterparts (*amiat* etc.) represent an original form, there is a natural solution analyzing the numeral **tām* <**tā-Ham(-āh)* "8" = "three above" with augmentative confixes **tā- ...-āh*. The same internal structure can also be recognized in the following numeral **tūẓāh & *tiẓāh* "9" < **tā-kūẓ-āh & *tī-kūẓ-āh* resp. "four above" (see below). Accepting the Egyptian cognate **ḫamt-*, one expects **ḫ* or **γ* in Berber. Perhaps the vacillation *ḫ ~ h/∅* has operated here (Prasse 1972: 111 quotes the example *härnän* "montrer les dents" vs. *ḫärnän* "grincer des dents"). It is important to emphasize that also in some Afroasiatic branches just the numeral "8" is formed according to the quinary pattern: East Cushitic **š/sizḥeet- / *š/sizḥent- / *š/sazḥent-* "8" > Hadiya *sadento*, Sidamo *sette*, Kambatta *hezzetto*, Burji *hidítta* (**ḥizzeet- < *ḥiszeet- < *sizḥeet-*); Somali *siddeed*, Oromo *saddeet*; Gollango *sette*, Tsamakko *sezzen*; Yaaku *siite* (Sasse 1982: 95), analyzable as a compound of ECu **s/šizḥ-* "3" and the numeral "5" preserved yet in HECu **omut-* > Burji *umútta*, Sidamo *onto* etc. (Sasse 1982: 184; Haberland & Lamberti 1988: 136–37) and Eg **ḫamV̄n-* "8" vs. **ḫamt-* "3" (Holmer 1966: 35).

The possibility of an external comparison within Afroasiatic cannot be excluded either. So Ehret 1980: 290 reconstructs SCu **ʔitām-* "3" > Iraqw, Burunge, Alagwa *tam*, Qwadza *tami*; ? Dahalo *ʔíttaantóóni* "third day after tomorrow". It is plausible to connect it with the Berber **tām* (~ **hittām*) "8" again on the basis of the additive pattern "[5 +] 3". In spite of its semantic and phonetic acceptance, this etymology remains questionable for the isolation of the South Cushitic examples within Afroasiatic.

On the other hand, the Semitic numeral "8" probably represents a derivative of the numeral "2", as the confrontation of the skeletons: *ṯ-n-y* "2" vs. *ṯ-m-n-y* "8" can indicate. The primary shape might be reconstructed as **ṯāniy-mā* or **ṯanīy-mā* "the second not" (cf. Ar *mā* "not" — so Blažek 1990: 1990: 31) or **ṯāniy-/*ṯanīy-* + **min-* [**ʕaśar-*] "the second from [ten]" — cf. Se **min* "from" (Gray 1934: 71, 74) and Be **mīn* "without" (Prasse 1972: 230), naturally with the following metathesis.

Bomhard (1984: 152) compares the Berber and Semitic numerals "8" with ECu **tom(m)an-* "10", reconstructing AA **tʾam(a)n-* "8". The difference "8" vs. "10" remains unexplained.

9. Reconstructing pBe **taṣṣaʔu* "9", Rössler (1952: 143) proposes a cognate in Se **tišʕ-* id. In spite of his categorical affirmation "Entlehnung aus-

geschlossen", the Semitic origin is quite possible, esp. when Guanche cognates are missing. After all, the rather devious form *cə́wuz* "9" recorded by Klingenheben by 'Amiln in the Sus area is evidently influenced by Moroccan-Arabic *cʕūd* "9".

Two forms for "9" are known from Canarian Islands: (i) *aldamorana* (Gran Canaria ?), (ii) *acot* (Tenerife ?). The form (i) consists of *marava* "10" (with emendation *n* = *u* ?), while *alda-* can be identified with Šawiya *ald(a)* "jusque, jusqu'à", hence "9" = "up to ten" (Woelfel 1954: 11). The form (ii) corresponds evidently to *acodetti* "4". It implies an original ellipse from **sumus akod/t.*. "5 + 4" or sim.

This second pattern opens a possibility to analyze the properly Berber numeral "9" in a similar way. Vycichl 1961: 253 described a specific Berber grammatical category **augmentative** formed by pBe confixes **tā-...āh* (cf. Šlh *abrid* "Weg" vs. *tabrida* "breiter Karawanenweg"). If we apply this pattern for the numeral "4", we get **tā-kūẓ-āh* *"four more" or *"four above"; further perhaps **tāūkẓāh* > **tūẓ(ẓ)āh* > Zenaga *tuḍa* (so Prasse 1974: 406 who reconstructs **tūẓah*, seeing in the vowel *u* an influence of the numeral *šuḍəš* "6"). The *ū*-vowel is also attested in Ghadames *təṣū(t)*, with *ū* in the second syllable probably appearing thanks to metathesis. The North & South Berber variant **tiẓ(ẓ)āh* can represent a plural of the same formation (**tī-kūẓ-āh* ?).

Let us add that the Semitic numeral "9" probably also continues in the subtractive pattern (cf. §3.8.). It is very remarkable that Se **tišʕ-(at-)* "9" and one of the Semitic numerals for "one", namely **ʕaštiy-(ān-)* (Ak m./f. *ištē/īn(um)*, *ištiānum / ištiat*, *ištē/īt(um)* "1", *ištēnšeret*, poet. *ištēnešret*, Ug *ʕšt ʕšr / ʕšt ʕšrh*, He *ʕaštēʕāśār* "11", Epigraphic South Arabian *ʕs¹tn* "1") differ only in the order of consonants. This fact can represent a key to the etymology. If metathesis could really serve as a way of expression of the semantic polarity (cf. examples collected by Majzel' 1983: 246 as Ar *ǧamīl* "fair, excellent" vs. *lamīǧ* "disfigured", etc.), it is possible to understand the opposite order of radicals forming the numeral "9" just as the expression of an "absence of one". An alternative solution can consist in a radical simplification (haplology ?) of a hypothetical syntagm **ʕaštiy- *ʕašti/u *ʕaśar-* "one from ten", cf. Ak *išt(um)*, *e/uštu* "from, of" (AHw 401) and Eblaite ÁŠ-DU "out from", ÁŠ-TI "from" (Diakonoff 1988: 68 and 1990: 28).

10. It was already Meinhof (1912: 240) who connected Be **marāw(-at)* "10" with Eg **mūḏ-aw*, *-at* id. This comparison was accepted by Zyhlarz (1931: 137 and 1934: 104, 106), assuming a regular correspondence between Be **r* & Eg *ḏ*. Rejecting this comparison just for the incompatibility of these consonants in Berber vs. Egyptian, Vycichl (1983: 124) also mentions that *-w* represents an integral part of the root of the Berber numeral, while it serves only as a masculine marker in Egyptian. Rössler (1966: 227) modified the comparison, postulating a primary form **m3ḏ.w* for Egyptian and **m-r-ʔ-w* for Berber. The loss of medial *3* is not unusual in Egyptian. So Edel 1955–64: 58 quotes e.g. *zb* vs. 'standard' *z3b* "jackal". Rössler assumed a regular corre-

spondence between Eg *ḏ* and unattested Be **ʔ*, which has to reflect AA **ʕ*. But AA **ʕ* has been preserved in Egyptian (Ember 1930: 32–33; Cohen 1947: 85–90). There are really a couple of examples which should demonstrate the regularity of the correspondence between Eg *ḏ* and Se **ʕ*: *sḏm // *s-m-ʕ* "to hear", *nḏm // *n-ʕ-m* "sweet", *nḏs* "to be small" // **n-ʕ-ś* "to be weak" (Albright 1918: 92, fn. 4; Ember 1930: 111–12), although they are not unambiguous. Perhaps an easier solution could consist in the modification of the Berber reconstruction in **marāgw* giving **marāw(w)* in most of languages, and **marāg(g)* in Zenaga and Guanche of Tenerife. It is generally accepted that Eg *g* before **u* has been palatalized in *ḏ*. Let us mention that the vacillation *w* ~ *g* has been usually interpreted as a result of development of the original **ww* (Prasse 1972: 64–65).

So far there has probably been no attempt to find the etymology within Berber. Analyzing the Berber numerals 3–10, Prasse (1974: 406) formulated a tempting hypothesis that they can be interpreted as the 3rd person of perfect of the conjugation IV (verbs of permanent quality with the same vocalic patterns **ă-ā*, **ă-ī*, **ă-ū* as the numerals 3–10 and with zero ending in masculine and **-at* in feminine). If we accept this 'verbal' hypothesis, in the form **marāw* "10" the reflexive prefix **m-* may be identified (cf. Prasse 1973: 61). This identification leads to the root √*(H)-r-w*, which can be found in Zayan *uɬu*, pl. *uɬawen* "content of two joined hands" (Loubignac 1924: 422).

Not regarding the preceding etymology and with respect to the problematic cognate in Egyptian, the question of external origin should also be admitted. There are suggestive Nilo-Saharan parallels: pNubian **muri* "10" > Hill Nubian **bure* // Taman *mar-tɔk* "10" = "10 x 1" // Bari (East Nilotic) *mɛrɛ gɛlɛŋ* "10" = "10 x 1" // Tubu (Saharan) *múro* "10" etc. (Blažek 1997: 167) etymologizable within Nilo-Saharan, cf. Nilotic **mɔr* "finger" (Dimmendaal) > South Nilotic **mɔɔrɪn* id., East Nilotic: Bari pl. *mɔrɪn* or West Nilotic: Jumjum *mɔreen* "all" (Bender).

11. Stumme 1899: 34 opined that Šlh of Tazerwalt *měrâwin* "20" represents a relic of an old dual from *měrâw* "10". Diakonoff 1988: 64 analyzed the ending *-in* < **-ay-* & **-n*, hence the marker of dual in oblique cases plus nunation. The same principle is also used in Semitic (**ʕâśar-ā* "20" = dual of **ʕâśar-u(m)* "10") and in Egyptian (**ḏwty* "20" < **ḏawắt-ay* < **mūḏawắt-ay* = dual f. of **mūḏaw* "10").

Zenaga *tešinde* (RB) = *tašəndəh* (Nicolas) "20" is derived from the numeral "2" probably by the same augmentative prefix forming the numerals "8", "9". In the suffix *-e/əh* the original dual **-ay* can be recognized.

12. Zenaga (RB) *tukarḍa* "30" is probably also formed by the same augmentative confixes **tV- ..-āh* as "8", "9"; hence "30" = "super-three" ?

13. Klingenheben 1926–27: 42–43 assumed an Arabic origin for the common Berber numeral "100", which is reconstructed as **tē-mihḍay*, pl. **tī-muhāḍ* by Prasse 1974: 406. But there are more apparent borrowings of the Arabic *miʔa(t)* "100" in Berber: Ghadames *mia*, Šlh of Tazerwalt *miá & mīt* etc. This indicates that Arabic *miʔa(t)* "100", as the source of the form **tē-mihḍay / *tī-muhāḍ*, need not be unambiguous. Besides the Arabic form, Ph *mʔt*, Ug sg./pl. *mỉt/mảt* = **miʔt-/*miʔāt-* (Segert 1984: 191) and Sabaic *mʔt* should also be taken into account (in this case we must assume the development **-ʔt-* > **-ṯ* > *-ḍ-*).

An alternative Semitic source can be seen in Se **maʔād-* "many, plenty" > Ak *mādu*, Ug *mảd*, He *məʔōd* etc. (Klein 1987: 308).

Semantically fully legitimate is also the comparison with the numeral "10". So Eg **mw̌ḏ-* "10" agrees phonetically, because both Be **ḍ* and Eg *ḏ* can be derived from AA **ç̣* or **ĉ̣*. Similarly some East Chadic forms for "10" can be related: Sumrai *mwàj* (Jungraithmayr & Ibriszimow 1994/II: 321) = *moj* (Nachtigal) = *moid* (Adolf Friedrich) = *moet* (Decorse), Gabri, Dormo *moid*, Tchiri *mōdo* "10" (Lukas 1937: 74, 87). It is tempting to interpret the Berber numeral "100" as an augmentative of an unattested form for "10", corresponding to Egyptian and East Chadic counterparts, hence "100" = "super-ten".

Let us add that the Berber numeral "100" was borrowed into Fula in the forms *teemedere ~ teemerre*, pl. *teemeɗɗe ~ teemedde* "100" (Koval' & Zubko 1986: 118).

14. Hanoteau 1860: 260 quoted isolated Mzab ("Beni-Mozab") *twinest*, pl. *twinas* "100". Klingenheben (1926–27: 43, fn. 1) sees in it the primary Berber denotation of this numeral. Etymologically it could be connected with the word "ring, circle", known e.g. from Ayr *tawəynəst*, Ahg *tăwînəst*, pl. *tiwînâs* < **tā-wiynist / *tī-wuynās* or **tā-wihnist / *tī-wihnās* (Prasse 1974: 53, 133). The semantic motivation can be the same as in Eg **š(n)t*, Coptic ^{SB}ϣⲉ, ^{F}ϣⲏ "100", derived probably from *šnj* "to be round" (Wb IV: 489; Loprieno 1986: 1309). In the system of figures described for Ghadames the sign 'circle' means "ten" (Hanoteau 1860: 267–68; Vycichl 1952: 81–82; Lanfry 1973: 275). In Tifinagh and its predecessor Libyan script, the 'circle' designates *r*, perhaps a modification of North Arabian (Tamudic or Liḥyan) 'semicircle' designating also *r*. The meaning "10" of the 'circle' is probably borrowed from some South Arabian source, where the 'circle' designates both ʕ ('circle' = "eye" = Se **ʕayn-*) and "10" = *ʕs₂r* (Vycichl 1952: 83). The sign for *m* is also used for the numeral *mʔt* "100" in Epigraphic South Arabian. In the New Tamudic script from North Arabia, one of the signes for *m* is represented by two concentric circles (Jensen 1969: 329). The borrowing could have been realized either thanks to commercial contacts or after the invasion of various Arabian (not only Arabic !) tribes in North Africa in the second half of the 7th cent. (Ghadames, i.e. classical Cydamus, was conquered in 667 AD). In the present Ghadames system of figures the sign *b* "100" is used, probably representing

the modern Arabic letter *ṭ* (could it reflect the anlaut of one of the forms: Ahg etc. *temeḍe* or Mzab *twinest* "100" ?).

15. SBe **ā-gihīm*, pl. **ī-gihmān* "1000" (Prasse 1974: 407) has no safe etymology within Berber, perhaps with the exception the comparison with Ghd *egm* "to grow" (Lanfry 1973: 112).

There are also at least hypothetical parallels outside Berber: WCh **(n-)gʷam-* " to fill, be full" > Montol *gum*; Bolewa *gom* etc. (Stolbova 1987: 217–18) or **gam* "to finish, complete" > Hausa *gámà*; Sura *gam*; Saya *gəmà* etc. (Stolbova 1987: 218) and Se: Ar *ǧamm* "plenty, abundance; numerous" besides *ǧamaʕa* "to gather, assemble", *ǧimāʕ* "whole, entire, all; sum, total, the whole, plenty" etc. (Steingass 1988: 243–45). The semantic motivation can be illustrated by ECu **kum-* "1000" > Somali *kun*, pl. *kuman*, Oromo *kuma*, Sidamo *kume* etc. (Sasse 1982: 120), maybe a borrowing from Omotic, cf. Wolaita *kum-* "to be full, fill" (Cerulli).

§4. Conclusion

1) The most archaic Berber numerals are "1" and "2" with convincing cognates in Egyptian and Semitic (AA roots **w-ʕ-y* and **čin(y)-* resp.).

2) The numerals "3" and "4" are etymologizable on the Berber level ("3" < "scratch[-finger]", "4" < "handful of"), although there are more or less hopeful Chadic parallels.

3) The different Guanche **ami(r/l)at* "3" is perhaps related to Eg **ḫamt-*, and maybe also to Beja *mahây*, if it is derivable from **hamây*.

4) The Berber numerals 5–9 resemble suspiciously their Semitic counterparts. At present, at least for the numerals "5", "8" and "9" there are independent Berber etymologies possible. The situation can be demonstrated as follows:

	Semitic	etymology	Berber	etymology
5	**ḫamiš-*	?	**sammūs*	? **yis-hammās [ən-Ifahāsan]* "to the half [of hands]"
6	**šidš-* or **šidṯ-*	**šid-šid-* "3 + 3" or **šid-ṯin-* "3 x 2"	**saddīs*	?
7	**sabʕ-*	"index (finger)"	**sāh*	?
8	**ṯamānay-*	**ṯāniy-mā-* "2nd not" or **ṯāniy-min-* "2nd from"	**tām*	**tā-Ham-(āh)* "super-three" = "three above"
9	**tišʕ-*	**ʕašti-* **ʕašti/u-* [**ʕaśar-*] "one from [ten]"	**tūẓāh*	**tā-kūẓ-āh* "super-four" = "four above"

If the proposed etymologies are correct, the Semitic numerals "8" and "9" represent the subtractive pattern of formation, while in the Berber counterparts the quinary structure is recognizable. The traces of the quinary system also appear in Guanche (Tenerife) *acot* "9" = "[5] + 4" and in some modern languages (see Table 4) as an innovation copying perhaps the old pattern. It

seems that in the history of the Berber numerals 5–9, a contamination of native forms with the quinary structure and Semitic borrowings (probably preceding the Arabic influence) has taken place. A more precise determination of the Semitic source is difficult. The phonetic features (*ṯ > ṯ) and the historical circumstances indicate two candidates: Ugaritic and pre-Arabic languages of the Arabian peninsula, on the other hand Phoenician / Punic is excluded (*ṯ > š). The process of borrowing (or better accomodation) of Semitic numerals into Berber could be connected with the borrowing of script and figures.

Still more complicated is the situation of the Guanche numerals 5–8, which reveal the same Semitic influence as their Berber counterparts. It is difficult to imagine that the first migrants from the continent brought already "contamined" numerals. The typological analysis of the archeological material allows to date the first settlement of the Canary Islands already to the 3rd mill. BC (Bol'šakov 1980: 45). But there were more migration waves (Bol'šakov 1980: 50). So Militarev 1988: 101–07 tried to demonstrate the presence of the speakers of Tamahaq (Tahaggart etc.) on the Canary Islands, putting it between the 7th and 10th cent. AD, hence to the time, when the contamination of the Berber and Semitic numerals was certainly started. The forms *arba* "4" and *cansa* "5" (Tenerife ?) represent late Arabic borrowings.

5. For the numeral "10" there are (i) an internal Berber etymology, (ii) an Egyptian parallel, (iii) Nilo-Saharan parallels. The case (ii) seems to be least convincing, esp. for the phonetic incompatibility.

6. The numeral "100" can be of Semitic origin; alternatively it is compatible with the numeral "10" in Egyptian and some East Chadic languages. The isolated Mzab *twinest* "100" = "circle".

7. In spite of some possible parallels within Berber and other Afroasiatic branches the origin of the numeral "1000" remains obscure.

8. Besides the AA archaisms "1" and "2", there are hypothetical isoglosses connecting the Berber & Chadic numerals "3", "4", "5" and perhaps "100"/"10", and/or Berber & Nilo-Saharan numerals "4", "10". Regardless of the other possible interpretations, they can represent early contacts perhaps in the Saharan-savannah borderland somewhere in northern Sudan.

Abbreviations

AA Afroasiatic, Ahg Tahaggart, Ak Akkadian, Ar Arabic, As Assyrian, Be Berber, Ch Chadic, Cu Cushitic, E East, Eg Egyptian, Ghd Ghadames, H Highland, He Hebrew, Kbl Kabyle, N North, O Old, p proto-, Ph Phoenician, S South, Se Semitic, Šlh Tašelhait, Ug Ugaritic, W West.

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KARTVELIAN NUMERALS

§1. The Kartvelian language family represented by four languages known from South Caucasus, can be classified as follows (the data in brackets mean the estimations of the beginning of divergence according to 'recalibrated' glottochronology developed by S. Starostin — cf. Testelec 1995: 14):

Common Kartvelian[2800 BC]

A. Svan

B. Georgian-Zan [800 BC]

1) Georgian

2) Zan

a) Mingrelian

b) Laz

§2. In Kartvelian languages the following underived forms of cardinal numerals are known:

	Georgian	Mingrel	Laz	Svan
1	*ert-i*	*art-i*	*ar(t)-i*	*ešxu*
2	*or-i*	*žir-i, žər-i*	*žur-i*	*jor-i, jerb-i*
3	*sam-i*	*sum-i*	*sum*	*sem-i*, dat. *sam-w*
4	*otx-i*, dial. *otxo*	*otx-i*	*o(n)txo, otxu*	*woštxw*
5	*xut-i*	*xut-i*	*xut-i*	*wo-xušd, wo-xwišd*
6	*ekvs-i*	*amšv-i*	*a(n)š-i*	*usgw-a, usḳw-a*
7	*švid-i*	*škvit-i*	*škvit-i*	*išgwid, išḳwid*
8	*rva*	*(b)ruo*	*ovro, orvo*	*ara*
9	*cxra*	*čxor-o*	*čxo(v)r-o*	*čxar-a*
10	*at-i*	*vit-i*	*vit-i*	*ješd, ješṭ*
20	*oc-i*	*eč-i*	*eč-i*	*(jerw-ešd* = 2 x 10)
100	*as-i*	*oš-i*	*oš-i*	*ašïr, äšir*

§3. Reconstructing the proto-Kartvelian phonology, the most different results are those of K.H. Schmidt on one hand versus Klimov, Gamkrelidze (& Mačavariani) and Fähnrich on the other hand (the problem is discussed e.g. in Testelec 1995):

	Schmidt 1962	Klimov 1964	Gamkrelidze & Ivanov 1984	Fähnrich & Sardshweladse 1995
1 „other"	**ert-i* (77,107) **šxwa-* (133)	**ert-* (79) **s$_1$xwa-* (178)	**ert-* (253)	**ert-* (124) **s$_1$xwa-* (322)

	Schmidt 1962	Klimov 1964	Gamkrelidze & Ivanov 1984	Fähnrich & Sardshweladse 1995
2	**jor-i* (129)	**jor-* (149)	**jor-* (253)	**jor-* (267–68)
3	**sam-i* (131)	**sam-* (161)		**sam-* (294)
4	**otjxw-* (128)	**o(s$_1$)tx(w)-* (150)	**o(s)tx(w)-* (879)	**otxo-* (269)
5	**xutj-i* (75,159)	**xu(s$_1$)t-* (262)		**xut-* (555)
6	**ekšu/w-* (63,107)	**eks$_1$w-* (80)	**ekšw-* (878)	**eks$_1$w-* (125)
7	**škwid-* (142)	**šwid-* (216)	**šwid-* (875)	**šwid-* (429)
8	**rúa /*árua* (130)	**arwa-* (44–45)	**ʃwa- / *arwa-* (879)	**arwa-* (35–36)
9	**čxara-* (151)	**c$_1$xra-* (232)		**c$_1$xar- /*c$_1$xr-* (469)
10	**atj-i* (92)	**a(s$_1$)t-* (45)		**at-* (32)
20	**oč-i* (129)	**oc$_1$ ǫ* (151)		**oc$_1$-* (271)
100	**aš-i* (93)	**as$_1$ ǫ* (45)	**aŝ-* (253)	**as$_1$-* (38–39)

§4. Comparative — etymological analysis

1.1. GZ **ert-* "1" must be separated from S *ešxu* id. (see 1.2.) in contrary to Schmidt (1962: 77). The numeral could perhaps be derived from the GZ verb **rt-* "to make, begin" (FS 287). The semantic motivation **first** numeral = **beginning** numeral has an analogy e.g. in Welsh *cyntaf* "the first", Old Irish *cét-* etc. vs. Old Church Slavonic *načęti* "to begin", *konь* "beginning" (Pokorny 1959: 564). If this etymology is correct, the numeral seems to be an innovation.

1.2. S *ešxu* "1" is related to G *sxva* "anderer, zweiter, fremd, ein", M *šxva* "anderer, fremd", Laz *čkva* "anderer, übriger" (Klimov 1964: 178; FS 322). The meaning "one" (S) can be an archaism in confrontation with the semantic dispersion in GZ branch. A parallel semantic development probably appears in Slavic **inъ* "other" (**ēino-* < *e-oino-*) vs. IE **oino-* "one".

An absence of any internal etymology within Kartvelian gives a legitimity to seek external parallels. Trombetti 1923: 110 collected the following comparanda: a) Khvarshi *has*; b) Semitic **ʃaš-t-* ; c) Sumerian *aš*; d) Brahui *asi*. Let us analyze these comparisons.

a) Khwarshi *has*, together with other Didoan forms (Ginukh *hes*, Inkhokvari *hos*, Bezhta *hõs*, Gunzib *hǝs*), reflect the nom. of proto-Didoan paradigm **hǝs* vs. obl. **ssi-* (Gunzib *si-d*, Bezhta *si-d* and Didi nom. *sis*). Among the parallels in other North Caucasian branches (Avar-Andi **ci-*; Lak *ca*; Dargin **ca*; Lezgin **ssa*; Khinalug *sa*; WC **zV*; Urarteian *šusi-* "1", *šuini-* "all") the closest relative appears in Nakh **čha* "1" > Chechen *čhaʔ*, Ingush *caʕ*, Bats *čha* (NCED 323–324: NC **cHǝ* < **cəħV* or **ħəcV*).

b) For Semitic **ʃašt-ay-* (Akkadian *ištēn(um)* "1", *ištēnšeret*, poet. *ištēnešret* "11", Ugaritic *ʕšt ʕšrh*, Hebrew *ʃaštēʃāśār* "11", Epigraphic South Arabian *ʕs$_1$tn* "1" — see AHw 400–401; Aistleitner 1965: 244–245), the most probable cognates within Afroasiatic appear in Omotic: Yemsa *issoo*, *isson*, Chara *issaa*, Wolaita *ista*, Zala *istaa*, Malo *istá*, Gofa *issi(no)*, Dache *isiyno*, Dorze *isiino & istaa*, Nao *is(i)n* etc. "1" and perhaps also in Chadic: (Central)

Mafa *sətaɗ*, Sulede *sta*; ? (East) Mokilko *só* "1" (Blažek 1990: 34). The comparison of AA **ʃaši-(-t/n-)* "1" and K **ešxu* "1" > 'other' is in principle possible even in the genetic plan, if we accept the following development: **ʃaš[u]-* > **ʃšwa-* > **šʃwa-* > **šẖwa-* > K **šxwa-* or sim.

c) Sumerian *aš* means really "1" in the standard dialect (Diakonoff 1983: 85).

d) In agreement with Dravidian historical phonology, Brahui *asi* "1" (adj.), *asiṭ* "1" (entity), *asīke* "once" must be derived from proto-Dravidian **onṟu* "1" (DEDR # 990 and table 1; Zvelebil 1970: 172) < **or-tu* with the neuter suffix **-tu* (Andronov 1978: 239–240).

2. K **jor-* "2" is the only proto-Kartvelian form reconstructed with the initial **j-*. It were already Caldwell (1913/56: 327–28), and later Fähnrich (1966: 149), who pointed to the parallel in Dravidian **ir-* "2" (DEDR # 474).

3. K **sam-* "3" has a suggestive parallel in Lak *šam-a* "3" (Trombetti 1902: 196). The other related forms are Khinalug *pšʷa* "3" and Tabasaran *simi-çur*, Agul *šin-çur* "30" (NCED 978: **ɕwimHV*). Trombetti (l.c. and 1923: 201) recognized the cognate in Sino-Tibetan **(g-)sūm-* "3" and Yeniseian **doʔŋa* "3", cf. also Bouda 1957: 83 and Starostin 1982: 210 & 1995: 222–223.

4. K **otxo-* "4" is probably a more preferable reconstruction than **o(s$_1$)tx(w)-* (Klimov 1985: 207). The presence of the cluster *-št-* in Svan can be explained by analogy to the following numeral *wo-xušd*, *wo-xwišd* "5". The attempt of an internal etymology of the type **otxo-* = "2+2" = **or-* "2" (only G) & **ṭq̇u-* (K **ṭq̇ub-* "twin" — see FS 340) is quite improbable (Klimov 1985: 207). But already van Ginneken and Frei noticed the resemblance of K "4" and IE "8", traditionally reconstructed **okt̄o(u)* and interpreted it as dual of a hypothetical sg. **okto-* *"4". This idea was supported by Henning, who analyzed the system of Old Iranian metrology. He determined that the meaning of Avestan *ašti-* corresponds to Greek παλαιστή "the breadth of ***four*** fingers" (1942: 235) and identified it with the expected Iranian **ašta-* < **okto-* (1948: 69). Accepting this etymology, Klimov (1977: 162–163; 1985: 206–207 with older literature) finds a support in examples of the type Aimara *pusi* "4" vs. Quechua *pusex* "8" or Ob-Ugric **ńīlə* "4" vs. **ńīləγ* "8" (Honti 1982: 171), where "8" represents probably dual of "4" (Gulya 1976: 314). The metathesis in the substitution IE **-kt-* > K **-tx-* has an analogy in K **usx(o)* "bull for sacrifice" < IE **uksōn-* (Klimov 1994: 476). On the other hand, Manaster-Ramer (1995: 16–17) prefers to reconstruct K **os$_1$tx(o/w)-*, seeing here a substitution of the *satəm* variant of the IE **oktoH* "8" (but the final *-x-* can also be explained from the alliteration with the following numeral **xu(s$_1$)t-*). If it is accepted, the semantic change "8" > "4" can be connected with the opposite semantic shift for K **arwa-* "8" < Semitic **ʔarbaʃ-* "4". Manaster-Ramer finds a formal analogy in the case of the North American

language Northern Chumash (Hoka) where the Yokuts (Penuti) numeral "10" was borrowed as "5" and the native word for "4" changed its meaning to "8".

5. K **xu(s$_1$)t-* "5" has not unambiguous etymology. So far the following solutions have been proposed:

a) Internal etymology based on GZ **xuṭ-* "drücken" (Zycaf & Džindžixadze 1985: 874) is improbable for semantic and phonetic (**-ṭ-* vs. **-t-* !) reasons.

b) Bork (1907: 25) and later Oštir (1921: 129) compared K "5" and NC counterparts as Rutul *xud*, Khinalug *pxu*, Bats *pχi*, Kabardin *tx^{w}ə* etc. "5", reconstructed as EC **xx^{w}ə* and WC **(t)x^{w}ə-* by Klimov 1967: 307 or NC EC **ffiä/*ffiă* besides WC **s-x^{w}ə* in NCED 426.

c) Manaster-Ramer (1995: 16–17) proposes a borrowing of K **xus$_1$t-* "5" from some Semitic source of the type Akkadian f. *ḫamištu(m)* "5", *ḫamuštum* "5th", cf. Old Assyrian *ḫamuštum* "Fünfergruppe" (AHw 317; Riemschneider 1978: 69, 294), assuming a development via **ḫawištu* (or **ḫawuštu*).

6. K **eks$_1$w-* "6" was compared with its EC counterparts by Bork (1907: 25–26) and Oštir (1921: 130). Only Khinalug *zăk* "6" is formally similar, but it corresponds regularly to other EC forms, e.g. Kubachi *ēk*, Agul (Chirag) *rekka-l*, Dargwa (Akusha) *ureg-al* "6" etc. (NCED 219: NC **ʔrāⁿx̄E* "6"). Marr (1927 — see Klimov 1967: 308) tried to analyze the numeral in **e-* (**ert-* "1") & **kus-* (**xut-* "5"). But already Bopp (1848: 38) noticed the evident similarity of the K numeral "6" with its IE counterparts. Among the IE forms of this numeral a source of the type Armenian *vec'* "6", Greek Doric ϝέξ, Attic ἕξ or Old Prussian *(w)uschsts* "6th" was quoted (Klimov 1967: 308 & 1985: 206). But the sequence **-ks$_1$w-* perfectly reflects the initial cluster reconstructed in IE **Ksweks* "6". If this point of view is acceptable, the pre-K **kŝwe...* can represent a borrowing from some IE dialect, preserving the initial cluster (cf. Avestan *xšuuaš* or Sogdian of Khorezm *xwšw*, Yaghnobi *uxš* etc.).

7. K **šwid-* "7" was compared with IE **septṃ* "7" already by Bopp (1848: 38–39). But the IE numeral is very probably of Semitic origin, cf. Semitic **sab'átum* "7" (Illič-Svityč 1964: 7; Blažek 1997). The borrowing from a Semitic source of the type Akkadian f. *sebet(tum)*, *sibbittu* can explain the development in vocalism, assuming pre-K **šiwid-* > K **šwid-* (Klimov 1985: 206), but the unexpected initial *s-* in Akkadian against the reflexes of the Semitic **š-* in other Semitic languages suggests that the donor-language was not Akkadian. Testelec (1995: 25) offers a different solution based on the priority of clusters postulated by Schmidt: **šibʃit* > **šʃiwit* > **škwit.*

8. K **arwa-* "8" cannot be compared with Chechen *barh*, Bats *barλ* "8" (Oštir 1921: 129) which have good cognates within EC: Khwarshi *ba x̄a*, Andi *bejx̄'x̄'i-gu* etc. "8" (EC **bū̄nx̄e*), besides WC **p(p)əx̄'ə* "4" (NCED 314–

315). A more promising source seems to be the Semitic numeral "4", cf. Akkadian m. *arba'u(m)* "4" (AHw 66), Ugaritic *ʾarbʕ*, Hebrew *ʔarbaʕ* etc. (Klimov 1967: 308–309). Klimov (1985: 207) reconstructs the original source in the form of dual, e.g. in Akkadian **arba'ā(n)*. A similar way of formation of some even numerals is known in Ugaritic where the numbers "6" and "12" can be expressed as *tltṯm* and *ṯṯtm* resp., i.e. dual of *tlṯ* "3" and *ṯṯ* "6" (Brugnatelli 1982: 18).

Trombetti 1902: 198 proposes an alternative properly Kartvelian etymology based on subtraction **ara-(j)or-* "not two" > **arao(r)* — > **arwa-*.

9. K **c*$_1$*xar(a)-* "9" was compared with Semitic **tišʕ-* "9" already by Marr (1925: 74, 77; cf. Klimov 1967: 309). The initial cluster **c*$_1$*x-* should substitute the sequence *t-š-ʕ* of the hypothetical source. The symbol **c*$_1$ must reflect a sound close to *č* (cf. Schmidt 1962: 56, 151 writes directly **č*; Gamkrelidze uses the symbol **ĉ*). The substitution *ʕ* > *x* has an analogy in 1.2.b. The continuation of the Semitic **ʕ* implies that the donor-language could not have been Akkadian (at least the language known from written records) where the loss of all 'laryngeals' (with exception of *ḫ*) has taken place. It remains to explain the final part **-ar(a)-*. The variant *čxovro* in Laz discloses an influence of the preceding numeral ("retardation" after Marr). But there is yet one, rather neglected solution, assuming a compound **a*(*s*$_1$)*t-s*$_1$*xwa-ara-* "ten-*one-not-(+ lost verb)", cf. G *ar(a)* "not, no-" (Trombetti 1902: 198).

10. K **a*(*s*$_1$)*t-* "10" resembles some EC counterparts: Lak *aç*, Chamalal *aça-da*, Kubachi *wiç*, Chechen *itt* etc. (Oštir 1921: 130; NCED 245–246: NC **ʔĕnçĔ*). Manaster-Ramer (1995: 17) sees here a transformation of Semitic **ʕaŝarát-um* "10" (orig. m.). In this case a hypothetical source cannot be the historically recorded Akkadian where the change **ʕa-* > *e* took place (cf. *ešer & ešeret* besides more archaic Assyrian *ešar* "10" *& ešartu* "Zehnergruppe" — AHw 253). Finally, it is tempting to connect pre-K **aŝt-* "10" with Semitic **ʕašt-ay-* "1" (cf. 1.2.b), assuming "10" = "1 x [10]". This solution could be supported by K **as*$_1$*[ir]-* "100", if it represents a borrowing of West Semitic **ʕašīr-* "10th", hence K "100" = "tenth [ten]" ? (cf. §12).

11. GZ **oc*$_1$*-* "20" has no satisfactory etymology. The attempt of Lafon (1933: 18) to derive it from G *or-* "2" *& at-* "10" (K **jor- & *a*(*s*$_1$)*t-*) cannot be accepted for phonetic incompatibility.

12. K **as*$_1$*[ir]-* "100" was compared with the Semitic numeral "10" already by Trombetti (1902: 199). A possible source could be found in some ordinal patterns as *qaṭīl*: Hebrew *ʕāšīrī*, Syriac *ʕəsīrāyā* or *qāṭil*: Arabic *ʕāšir*, Geez *ʕašər*; Akkadian ordinals are formed on the pattern *qaṭul*: *ešrum* m.// *ešurtum* f. (Brockelmann 1908: 491; Moscati 1964: 118–119). This interpretation implies the original semantic motivation "100" = "tenth [ten]" (cf. Bats

atasi "1000" = **at-* "10" x *asi* "100" — all Georgian loans — Klimov 1985: 208). It is tempting to assume the same origin for the NC counterpart: Tabasaran *warž*, Agul *balrš*; Akusha *darš*; Lak *tturš* etc. besides Ubykh *šʷa*, Adyghe & Kabardin *śa* etc. "100" (Klimov 1967: 310; NCED 587–588: NC **Hlŏšwĕ*).

§5 Conclusion:

Kartvelian numerals can be classified according to their most probable origin as follows:

a) Inherited:

The numerals "1" and "2" are probably not borrowed. The hypothetical cognates within the Nostratic macro-phylum support their inherited origin. This semantic field can be extended: Svan *išgen* "other, another" can reflect K **č(w)en-*, cf. S *la-m-šged* "north" vs. G *črd-ili* "shadow" or S *mi-šgwi* vs. G *čemi* and Z *čkimi* "my" and S *gwi-šgwi* "we" vs. G *čveni*, L *čkuni*, M *čkini* — see Schmidt 1962: 57); this reconstruction is compatible with AA **čin-ay-* "2" > Semitic **ṯin-ay-* // Egyptian *snwj* // Berber **sīn* & **hissīn*; cf. also Hurrian *šin-* and Nakh **ši(n)* "2" (NCED 845–846).

b) North Caucasian origin:

In the case of the numeral "3", NC origin seems to be the most probable. Just this direction of borrowing can be supported by the existence of convincing external parallels within the Sino-Caucasian macro-phylum. The NC source is also not excluded for the numerals "5" and "10". The semantic field of the numeral words of North Caucasian origin can be completed: K **ṭq̇ub-* "twin" (Klimov 1964: 184; FS 340) vs. WC **ṭq̇l:ʷA* "2" > Ubykh *ṭq̇ʷa*, Adyghe *ṭʷə*; Khinalug *ḳu*, Tabasaran *q̇lu*, Kubachi *ḳʷe*, Lak *ḳi-a* etc. (NCED 924: NC **ṭq̇Hwā̆*); cf. also Nakh **ṭq̇a* "20" (NCED 456; Klimov 1967: 307).

c) Indo-European origin:

The numerals "4" and "6" are probably borrowed from an IE source (cf. also G *pirveli* "first" vs. IE **pr̥H₂wó-* id.). Its dialectal affiliation is naturally uncertain. If we do not take into account the possibility of the proto-Indo-European as a contacting entity, there are at least three IE branches which were or could have been in contact with people of Southern Caucasus: 1. Hittites, 2. Indo-Iranians, 3. Armenians.

Ad 1) Concerning the Hittite (Anatolian) numerals, our knowledge of this topic does not allow us to find any closer connections. There is a certain lexical evidence supporting the early contact of the Kartvelians and of ancestors of the Hittites (Giorgadze 1979: 64–66; Ivanov 1979: 111–129; Gamkrelidze & Ivanov 1984: 897–898). It is in good agreement with the archaeological data, demonstrating the Transcaucasian diffusion of the bearers of the Kurgan burials into Eastern Anatolia *c.* 3000 BC (Winn 1981: 113–118).

Ad 2) The phonetic shape of K numerals "4" and "6" resembles the Indo-Iranian data more than any others. An Indo-Iranian character of the donor language could be supported by the existence of other lexical parallels (Klimov 1993: 29–37). The most serious question, which remains open, is the localiza-

tion of the contact in space and time. The generally accepted presence of Indo-Aryans in Eastern Anatolia in the middle of 2nd mill. BC is too late; the numerals "4" and "6" represent a common Kartvelian level, i.e. the beginning of the 3th mill. BC or earlier (Testelec 1995: 14).

Ad 3) Armenian can be probably excluded as a donor language for phonetic and chronological reasons.

d) Semitic origin:

It is remarkable that most of the K numerals can be explained as Semitic borrowings, namely "7", "8", "9", "100", and probably also "5" and "10". There are only two Semitic languages with written records, spoken in a relative geographical proximity to Southern Caucasus in the 3rd mill. BC: Akkadian in Mesopotamy and Eblaite in Northern Syria. A hypothetical donor language can be characterized by certain features differing from historically attested Akkadian: in phonology esp. Semitic *ʃa- > K *a- vs. Akkadian *e-* (but Eblaite *a-*!) and in morphology the pattern of ordinals *qaṭīl* (cf. Hebrew or Aramaic) or *qāṭil* (cf. Ugaritic or Arabic) vs. Akkadian *qaṭul* (Eblaite numerals are not known, but cf. the personal name *Mu-sa-ti-sa* "she makes number 6" — Segert 1984: 54). There are more cultural Semitic borrowings in common Kartvelian lexicon, e.g. K **okro-* "gold" > G *okro-*, M *orko-*, S *(w)okwr-* (Klimov 1964: 151) vs. Semitic √*wrq* > Akkadian *(w)arāqu(m)* "gelbgrün sein", *ú-šá-ra-qu* "vergolden" (AHw 1463–64), Ugaritic *yrq* "Gelbes (Gold)" (Aistleitner 1965: 137), Hebrew *yārāq* "das Grüne", *yeraqraq* "goldgrün", Geez *warq* "Gold" etc. or K **ɯγel-* "yoke" > G *ɯγel-*, M *ɯγu-*, S *ūγwa-* (Klimov 1964: 186) vs. Semitic **ġull-* "yoke" > Old Canaanite (Tell Amarna) *ḫullu*, Hebrew *ʕol*, Akkadian *ullu* etc. (Illič-Svityč 1965: 334 — 35). The Kartvelian — Semitic contact can also be documented archaeologically. In the Maikop culture from Northern Caucasus (26th-23rd cent. BC), Safronov (1989: 242–58) has identified genetic links to the Upper Euphratian culture related to the Ebla civilization. He interprets this discovery as a result of the northward migration of the bearers of Syrian civilization, speaking a Semitic language, perhaps close to Eblaite.

The presented conclusions, if correct, mean that Kartvelian was under a massive influence of other language families (North Caucasian, Indo-European, Semitic), comparable with the infuence e.g. of Arabic on Siwa (Berber) or Indo-Aryan on Brahui where only "1", "2" and "1", "2", "3" resp. are unborrowed. The traditionally assumed conservatism of numerals is only myth.

Abbreviations:

AA Afroasiatic, C Caucasian, E East, G Georgian, IE Indo-European, K Kartvelian, L Laz, M Mingrel, N North, S Svan, W West, Z Zan.

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URALIC NUMERALS

For Vladimír Skalička (*Aug 19, 1909)

§1. The following are the (proto)forms of the numerals of the first decad in Fenno-Ugric and Samoyed languages:

	Fenno-Permic	Ugric	Samoyed
1	**ükti*	Ma Tj *ük*, KU *äk*^{v}	? SeT *ukkir, okkir*
		Kh V *ĕj*, Kaz. *ĭ*, I *it*, Hu *egy*	**oj-/*ə̑j-*
			**op*
2	**kakta*	**kektä*	**kitə̑*
3	**kolmi*	Kh **käälem*	
		Hu *három* // Ma **kuurem*	**näkur*
4	**ńi/neljä*	**ńiljĭ*	
			**tet$_{1}$tə̑ / *tettə̑ / *tejt$_{1}$tə̑*
5	**wi(i)t(t)i*	**wĭttĭ*	
			**səmpə̑ / *səmpəläŋkə̑*
6	**ku(u)t(t)i*	**kottĭ*	
			**mə̑ktut*
7	**śeŋćemä*	**θäpt3*	**sejt$_{3}$wə̑ < *sejptə̑*
8	FV **kakteksan < *kakta-tkak-s3*		
	Pe **kjktames < *kakta-tkam-3s(3)*		
		ObUg **ńĭ̯ləγ* // Hu *nyolc*	
			**kitə̑ntettə̑ < *kitä tettə̑*
			SeT *šittj čaŋg köt*
9	FV **ükteksä < *ükte-tkek-sɛ*		
	Pe **ók-tem-es < *ükte-tkem-ɛs(ɛ)*		
		Ma **änt-täl-lɔ̈γ*	
		Kh **ĕj-ĕrt-jɔ̈ŋ*	
		Hu *kilenc*	
			**ämäjt3mə̑*
			MTK **op-tV-jäŋkV*
			SeT *ukkir čäŋka köt*
10	FiMd **kümeni*		
	LpMr **luka*	Ma *lɔ̈γ*	
	Pe **das*	Hu *tíz*	
			**wüt*
			MT *ǯuen*

§2. Comparative-etymological analysis:

1.1. FP **ükti* "1" (UEW 81; S 552) can be of the FU age, if Ma TJ *ük*, KU *äk*^{w} id. is related (Szinnyei 1910: 108). Honti 1993: 75f adds Kh **ěj* and Hu *ëg(g)y* & *eg(g)y* deriving them from **ěγ /*ŏγ*^{w} and **iγɜ/*üγ*^{w}*ɜ* respectively, and reconstructs FU **ike/*üke* (= **üki* after S) — see 1.2. below. The internal FU etymology is uncertain, cf. perhaps Md *vejs(e)* "together" < **üke* (Honti 1993: 80); Komi *ęknam / ętnam* "ich allein" (Honti 1993: 82); FV **wikta* > Fi *vihdoin* "endlich, yhden kerran", Md **(v)ukta* > Erzja *udalo,* Mokša *ftal* "hinter" (SKES 1734–35; Keresztes 1986, n.516). A similar semantical development is known e.g. from IE languages: Welsh *cyntaf* "der erste" : Old High German *hintana, hintar* "hinter" and Old Church Slavonic *is-koni* "von Anfang" : *конъсь* "Ende" (Pokorny 1959: 564). The same semantical way out can be seen in SeT *ukkįr, okkįr* "1" : *ukį* "vorderes Ende; Nase; Vorderteil", *ukon, ukot* "früher, vormals" (Joki 1975: 729–30) < Sm **ukə̑* "Ende, Vorderteil" (SW 30) < U **ukɜ* "Kopf" (UEW 542–43). The initial sequence **vi-* in BF can probably be explained through contamination with FU **wiŋi* "Ende" > Fi *viimein* "endlich", *viime* "letztens, jüngst, vorig" etc. // Hu *vég* "Ende, Schluss, Zweck" (UEW 575). There is a promising external parallel in YkN *axte, ax* "only, alone" (Collinder 1940: 104). The difference in initial vocalism is perhaps comparable with FU (U ?) **püŋi* "grouse" (UEW 383; S 547–548) : YkS *pange* "kulik" (Krejnovič 1982: 80). On the other hand, there are also some possible Altaic cognates here: Tk **ük* "upper, superior" // OKor (Paekče) **oko*, MKor *'ux* "upper part, top, surface" // OJp *ökör-* "to arise", *ökös-* "to lift up" (Menges 1984: 291).

1.2. Hu *ëgy* and Kh **ěj* "1" are probably of pronominal origin (UEW 67; MSzFE 1: 141–142; Majtinskaja 1979: 174–175), although it is tempting to speculate about their relationship to their Sm counterpart (1.3.).

1.3. Sm **oj-/ *ə̑j-* "1" (Helimski 1986, 136; Janhunen does not separate it from Sm **op* id., see SW 28) has promising Altaic counterparts in Kor *oi, ö* "only, a single", *oi-nun-thoŋi* "one-eyed person", compared by Ramstedt (PKE 134) with Tg **ugi* "few" > Evenki *uγi, uvi*, Orok *oji* etc. (TMS 2: 246), and IE **oy-* in **oy-no-/ *oy-wo-/ *oy-ko-* "1", probably an old derivative of the IE anaphora **ey* (Hamp 1992: 904). There is a more probable Tg parallel in Oroč *ojoke* "some, one" (TMS 2: 9: Oroč + Mong *oira* "near") and perhaps pJp **uja* "the same" (Starostin 1972: 74: Jp + U **ükti* "1").

1.4. Sm **op* "1" (Helimski 1987: 77; Janhunen reconstructs **oəp* and derives it from **o(ə̑)-*, see SW 28) is comparable with possible Altaic parallels: KorN *obun* "all", S *on* "voll, vollständig, all" // Tg **up-ka-* "whole, every, all" // Mong *ogtalu* "fully" (SKE 177; PKE 133; TMS 2, 281).

2.1. U **kektä* "2" (S 537; UEW 118–119: **kakta / *käktä*) is the only numeral reliably reconstructed for the Uralic proto-language including the semantical identity of all attested forms. There are hopeful external cognates in Yk: Omok *tkit* "2" = **kit* ?, cf. *kit kimnel* "20" (Collinder 1957, 118; Tailleur 1959, 84 compares the Omok forms with YkN *kīn / kīd* "two" < **kiji-nt* with

the genitive marker *-*nt*, cf. Nikolaeva 1988: 18) and in Tg **gagda* "one of a pair" (TMS 1: 135: Tg + Mong *gagča /ganča* "one, single, only"; see also Dolgopol'skij 1969: 299: U + Tg), perhaps also in OJp *kata* "one (of a pair of set), single (member of a pair of set)" (Starostin 1972: 74; Street 1985: 641 derives it from Alt **kalta* "half"). Ankeria 1951: 137 and Dolgopol'skij, *Voprosy jazykoznanija* 1964/2: 57 also add ČK data to U "2", cf. Itelmen "2": Tigil River (Billings) *katxan*, Ukän (Pallas) *kaza*, W (Radloff) *kasx*, S (Krašennikov) *káss*, *kaáž* etc. (Anderson 1982: 31).

Note: There is an alternative attempt to find the external relationship for U "2" in IE **k$^{(w)}$et-* "pair" > Sl **četa* id. and Ossetic *cæd(æ)* "a pair of bulls in yoke" (Abaev 1: 293). Erhart 1970: 95 also sees the same root in **k^{w}et(e)-H^{w}o-r* "4" = "2x2" (?). If related to U **kektä*, it excludes the Tg form and allows to analyze the form **kektä* < **ketV* "2" + suffix of dual **-ka/*-kä* by way of a metathesis caused (at least in FU) by **ükti* "1" (more about the numeral "2" and dual in U – see Helimski 1982: 114–17).

3.1. FP **kolmi* & Kh **käälem* "3" stand in opposition to Hu *három* & Ma **kuurem* (S 543; UEW 174). The *-r*-forms can be original, if we accept the influence of the following numeral **neljä* "4" (Collinder 1965: 145). A hypothetical FU reconstruction could be **kurmi*. If we isolate the suffix **-mi* expressing perhaps the abstract noun "Dreiheit", we get a hypothetical root **kur-*, compatible with Sm **nä-kur* "3" (Castrén 1854: 194; Helimski 1987: 77; SW 99: **näkə̑(j)r*). The same demonstrative (?) marker **nä-* perhaps appears in some Sm postpositions: **näŋ* "zu" (dat.sg.), **nänå* "bei" (loc.sg.), **nätə̑* "von" (abl.sg.), **nämmə̑nå* (< **nän-mə̑nå*) (prosecutive sg.; see SW 99).

The protoform of the Altaic numeral "3" can be reconstructed as **gu[r]-*: Mong *gurban* "3", *gurmusun* "dreisträhnig, dreisträhniger Strick" (Collinder 1965: 145: FU + Mong), *gutagar* "third", *gučin* "30" < **gu[r]tin* (> Tg **gutin*, cf. Benzing 1955: 31); Mong (Khitan ?) > Jurchen **γuor-χuan* "13" (Miller 1975: 146) // Kor **ku* in MKor *nirkup* "7", KorN *nirgup*, KorS *ilgop* = **[n]yərh* "10" ...**ku* *"3" ...*ŏps* "be nonexistent", the negative of *iss-* *"to be, exist, have", cf. MKor *'yətïrp* "8" = "10–2", *'ahop* "9" = "10–1" (Miller 1971: 244; Menges 1984: 278; SKE 167: **il* "3" & **kop* "bending", cf. Tg **ïlan* "3") // ? OJp *kökönö-* "9", besides *nogono-* (Pallas) < **könököno* = *"3x3"? (Miller 1971: 236; Anderson 1982: 42), the Tg counterpart **xüyägün* "9" after Benzing 1955: 101, or **xegün* according to Starostin 1991: 141 (correctly probably **xünyägün* "9"), is perhaps compatible with OJp, but not with Alt **gu[r]-* "3".

Bouda 1952: 25–26 compares FU **kurmi* "3" with Čukči-Koryak **kurym* : Čukči *krym-qor*, Koryak *kyjym-qoj* "dreijähriges weibliches Rentier", where *qora* & *qoja* resp. mean "Rentier".

4.1. FU **neljä* /**ńeljä* "4" (S 546; UEW 315; Honti 1993: 92–93) has no evident cognates in Sm, but there are at least hypothetical parallels in Yk: Čuvan (Matjuškin) *njagon*, (Boensing) *nägane*, *näxane* "4" are derivable from **na[l]ga-*, cf. Čuvan (Matjuškin) *xanbamegej*, (Boensing) *xambo megii* "10" =

"double hand" vs. YkNW **malg-andklon* "4" = "double two", further YkN attrib./predic. *maleji-/malajla-* "6" vs. *ja-/jalo-* "3" (cf. Tg **ïlan* id., but "Tonsugu-Konni" by Strahlenberg (1730) *yelan*! — see Anderson 1982: 46) and *malejluku-/malajlakla* "8" vs. *jeluku-/ jalakla-* "4", besides YkS *melha-/melhalo* "6" vs. *ja-/jalo-* "3" and *malhileku / molhileqlo* "8" vs. *ileku / ileqlo* "4", cf. YkN *malhur* "on both sides" and YkS *malhi* "joint" (Tailleur 1962: 72; Krejnovič 1982: 114–118; Jochelson 1905: 113). On the other hand, the Čuvan "4" can be borrowed from Koryak, cf. (Krašennikov) *niáken* "4", (Pallas) *niyax*, (Bogoras) *ŋáyax* etc. (Anderson 1982: 30).

Traces of the root related to FU **ńeljä* "4" can be also found in Altaic. MKor *nəyh* "4" (Lee 1977: 174; about KorN *ndujin* "4" quoted in SKE 277 see Miller 1971: 219) can be derived from a hypothetical protoform **nəri-h*, cf. OKor (Silla) **narih* "river" > MKor *nayh* or **murih* "mountain" > MKor *moyh* (Lee 1977: 80), similarly MKor *səyh* "3" vs. *syərhin* "30" (Lee 1977: 174). A hopeful cognate can be identified in the Tg numeral "6", usually reconstructed **ńöŋün* (Benzing 1955: 101; TMS 1: 647–48) and interpreted as "2x3" (Miller 1975: 147). The pattern "2x3" is evident for Mong *ǯirgu-gan* "6", but doubtful for the Tg numeral in spite of Poppe's attempt to reconstruct a development **ńiŋgun* < **ńirgun* < **ǯirgun* (Poppe 1960: 130). On the other hand, a series of very archaic numeral stems is preserved in Jürchen names for the teens. So, for "16" the form *ni-χun*, earlier *nül-χon*, corresponding with Manchu *niolxun* "16th day of the 1st month", while for "6", Jürchen has **niŋ-ǯu* (Miller 1975: 147). On the basis of these data the Tg prototype for "6" can be modified into the form **ńöl-ǯu(n)* and interpreted as "10" (Tg **ǯuwan*) (minus) "4" (**ńöl-*). This subtractive model forming the numerals 6 — 9 is well-known from Ainu (Laufer, *JAOS* 37[1917]: 192–208) and probably from Korean (Miller 1971: 243–44 analyzes only 7, 8, 9 in this fashion, but MKor *'yəsïs* "6" reveals a presence of *'yərh* "10" similarly as *'yətïrp* "8"). Mong *nayiman* "8" could also belong here; it is possible to derive it from **nayid-man* where **nayid-* represents a regular plural to the sg. **nayil-*, and *-man* together with *-ban / -ben /-gan* are suffixes forming most numerals of the first decad (Blažek 1997: 48–49). Besides hypothetical Yukaghir and Altaic cognates, there is a perfect correspondent in the Dravidian numeral **nāl* "4" (DEDR #3655; cf. Tyler, *Language* 44[1968]: 807: FU + Dr; Menges 1984: 248: FU + Kor + Dr). Bouda (*Anthropos* 55[1960]: 358) opines that Nivkh root **nV* of the numeral "4" also appears in *ń-mar-i* "quarter" < **ń-nar-* and *minr-* "8" = "2" (*me*) x "4". This more archaic form **n(a)r* "4" corresponds well with the hypothetical Korean **nə[r]i-h* "4" (Krejnovič 1955: 135: Nivkh + Kor) and probably also with FU **ńeljä* "4" (Bouda, l.c. explains the change **l* --> **r* by the unacceptability of the expected cluster **nl-* in Nivkh).

4.2. Sm **tet̬tə̂ /*tettə̂ /*tejt̬tə̂* "4" (SW 159), of course, does not correspond with FU **ńeljä* (in spite of Menges 1975: 92). The attempts to find an internal Sm etymology are also unconvincing: (i) Joki 1975: 730 connected Sm "4" and Nganasan *ťatu-ame* "sehr, viel"; (ii) the formally similar word

**t$_1$et$_3$mə̑* "Band" (SW 158) could represent the same root **tet-* extended by various suffixes; but the semantical motivation is not clear (a similar semantical development was proposed for Ug **ńalə* "8" : Hu *nyalább* "Bündel, Bund", KhV *ńula* "zusammen" — see UEW 875 and below 8.3.).

On the other hand, Sm "4" could be a borrowing. The most probable candidates for a source are Tk forms of the type Čuvaš *tăvattă*, Volgaic Bolgarian **tüät* "4" (Benzing 1959: 730) or Lobnor *döjt, töjt, döt,* Salar *δöt, δot,* Ujghur dial. *tööt* etc. (Sevortjan 1980: 284–286), all from Tk **dȫrt* (Dybo). A source of the Čuvaš-Bolgarian type seems to be the most probable, because the same source of borrowing is evident for Sm **jür* "100" (SW 50; Janhunen, *MSFOu* 158[1977]: 125). The Sm + Tk comparison was presented already by A. Trombetti (1923: 395), but in a genetic framework.

5.1. FU **wi(i)t(t)i* "5" corresponds to Sm **wüt* "10" (S 541; UEW 577). The semantical relationship is certainly plausible, cf. e.g. SItelmen (Pallas) *kúmnaka* "5" : *kumextuk* "10" (Anderson 1982: 33). For U **wi(i)t(i)i* "5" (Janhunen, *JSFOu* 77[1981]: n.124 reconstructs **wi(t)ti/*wixti*) Joki (1975: 729) supposed the original meaning "grosse Anzahl, grosse Menge, viel", cf. Fi *viittä vaivainen vailla* "dem Armen fehlt viel". There are no evident external parallels, the only hypothetical exception would be OJp *itu* "5", OKor (Kogurjo) **utu* (Murayama) or **uč* (Lee) — see Miller 1971: 241; Kazár 1980: 60: Jp + U.

5.2. Sm **sə̑mpə̑* or **sə̑mpə̑läŋkə̑* "5" (SW 133) can be convincingly etymologized on the basis of Nenets *sampā* "in den Händen schaukeln, schwingen" (Joki 1975: 730).

6.1. FU **ku(u)t(t)i* or **kotti* "6" (S 544; UEW 225) and Sm **mə̑ktut* "6" (Helimski 1987: 77; SW 85) are evidently unrelated. But both the numerals were probably formed on the basis of the same semantical pattern: "six" = "beyond five", cf. (i) U **kuttə* "Rücken" (UEW 225) > MaN *χūtäl'* "hinter" etc.; (ii) U **mukå* "back" (S 538; SW 85) > Selkup Taz *moqoqit* "hinter, hinten" etc. If this etymology is correct, the Sm numeral represents a compound **mə̑kt-* & **-ut*. The latter component is probably identical with Sm **wüt* "10", preserving the original meaning "5". Alternatively, Sm **utå* "hand" (SW 30) could be identified here, cf. IE **Ksweḱs* "6" < **ĝʰs-weḱs* "hand-overgrowing". There is a suggestive parallel in Ossetic *farast* "9" = "beyond 8" (Winter 1992a: 14). The traditional interpretation of Sm **mə̑ktut* based on the comparison with Kamasin *mâkter-* "schreiten" etc. < U **mukča-* "über das Wasser fahren" (so Joki 1975: 730; cf. UEW 284–85) is perhaps plausible semantically (cf. Eskimo of SWAlaska *ar'Firtoa* "I cross over to" vs. *arFinligin* "6" — see Thalbitzer, *JSFOu* 25/2[1908]: 13), but less probable for phonological reasons (UEW 284).

7.1. FP **śeŋćemä* "7" (UEW 773; S 553: **śe(e)ślćVmi*; Honti 1993: 100 reconstructs **śejććem* comparing it with Sm **sejt$_3$wə̑* "7", cf. 7.3.) is probably borrowed from some Baltic dialectal form of the type OLithuanian *sẽkmas* "7th" (Fraenkel 2: 772). Napolskikh 1995: 126 prefers some early Slavic

source (certainly preceding East Slavic **semь*, perhaps a hypothetical ***sedemь*), but this solution entails serious difficulties in phonology and chronology.

7.2. Ug (Hu & Kh) **θäpt(ɜ)* / Ma **sā̆t* "7" (UEW 844; Honti 1982: 138) has usually been derived from some Indo-Iranian source (Korenchy 1972: 70–71; MSzFE 284) preserving the original **s-*, contrary to the characteristic Iranian change **s* > **h* (FU **s-* gives regularly Ug **θ-*, while Ma **s-* reflects FU **ś-*). Joki 1973: 313 judges that Ma **sā̆t* can be borrowed from a different Indo-Iranian source (cf. Dardic: Šina *sat, sät*, Prasun *sɛtɛ* etc. and Mittani Aryan (Kikkuli) *šatta* !), rather than from Toch (cf. Toch A *ṣäptānt-* "7th"). On the other hand, Napolskikh 1995: 124 supposes just the Tocharian origin of the Ug "7". Winter (1992b: 109–110) reconstructs common Toch **šəpətə* continuing in Tocharian A and transforming in Tocharian B **šwət* > **ṣwat/*ṣwät* (further leading to the historically recorded forms *ṣukt, ṣūkt, ṣuk*, assuming the influence of the following numeral **aktu* > *okt* "8"; but the change **-pt-* > Tocharian B *-kt-* can be regular, cf. Napolskikh 1995: 120). A form resembling **ṣwät* could have been the source of pre-Mansi **sā̆t*, although the chronological correlation remains uncertain.

7.3. Sm **sejt$_3$wə̑* "7" (SW 139–40), with a more archaic variant in Sayan Sm **sejptə̑*, are probably of Tocharian origin too (Janhunen, *MSFOu* 185[1983]: 119; Napolskikh 1995: 119 prefers to reconstruct Sm **sejkwə̑* derivable from a source of the type Toch B *ṣuk(t)*).

8.1. FV **kakteksan* "8" has been analyzed in **kakta* "2" + Negationsverb **e-* + modal-reflexives Konjugationssuffix **k* + Px3 Sg **sä* + Dualsuffix **n*, hence "zwei existieren nicht" (UEW 643; Honti 1993: 108). Napolskix (1997) mentions that the hypothetical form **e-k-sä-n* is artificial without any support in real languages (e.g. in Fi it would give **eise*, but really *ei ole* is used). The negative auxiliary **e-* (UEW 68–69) is never independent. He proposes his own solution based on the abessive suffixes (a) for nouns **-tkak* ~ **-tkek* (Fi *-tta/-ttä*, Udm *-tek*) and (b) for adjectives & adverbs **-tkVm* (Fi *-ton/-tön*, Md *-toma*, Udm *-tem*). The final **-sɜ/*-sɛ* is probably a nominal derivational suffix (e.g. Udm *ńul-es* "forest" vs. *ńįl-pu* "Abies"). This approach allows us to recognize parallel structures in both Fenno-Volgaic and Permian numerals "8" and "9", differing only in the use of the abessive suffixes (a) and (b) respectively:

	Fenno-Volgaic	Permian	
8	**kakta-tkak-sɜ > *kakteksa(-n)*	**kakta-tkam-ɜs(ɜ) > *kįk-tam-es > *kįkjamįs*	"2-without-consisting of"
9	**ükte-tkek-sɛ > *ükteksä*	**ükte-tkem-ɛs(ɛ) > *ök-tem-es > *ökmįs*	"1-without-consisting of"

8.2. Pe **kįkjamįs* "8" has been derived from **kįkja mįn(ɜ)ś* "8" (Honti 1993: 156), and analyzed as the compound **kįk* "2" + frozen suffix of dual **ja* + **mįn(ɜ)ś*, the ablative from Pe **mįn*, forming tens: Komi *komįn*, Udmurt

kvamin "30" etc. (Honti 1993: 117f). Besides the irregular depalatalization, this solution means two different ways of forming of the numerals "8" and "9" in Fenno-Volgaic and Permian, in contrast to the consistent solution of Napolskikh (see 8.1.).

8.3. Ug **ńʏlɜ-(kɜ-)* "8" > ObUg **ńi̯ləγ* // Hu *nyolc* (UEW 875; Honti 1982: n.462 and 1993: 111–15) probably represents the dual of Ug **ńiljï* "4" (Szemerényi 1960: 145; Gulya 1976: 314). This internal structure formally corresponds to IE * $H_2o\hat{k}to(u)H_1$ "8" = the dual of the form continuing in Avestan *ašti-* "breadth of four fingers" (Winter 1992a: 13). The main objection against this solution (Honti 1993: 112, 253, fn. 112) consists in the varying root vocalism of the numerals "4" and "8" (front vs. back). But the same opposition appears in the numeral "2" between the Fenno-Permic and Ugric Numerals.

The other etymologies, e.g. those based on Hu *nyaláb* "Bündel, Bund", KhV *ńula* "zusammen" or ObUg **ńăl* /**ńŏl* "nose" (UEW 875; Majtinskaja 1979: 166–67; MSzFE 488) are semantically rather vague. Given that in some Mansi dialects the protoform **ńalālŏγ*ʷ "8" consisting of **ľɔγ*ʷ "10" is reconstructible (cf. Honti 1993: 114), the "nose" etymology could be applied — although, of course, not with the primary meaning "Nasenzehn" (so Nyíri, Juhász — see Honti 1993: 113). It is possible to imagine the expression "8" = "[two] before ten" where "before" could represent the result of grammaticalization of the ObUg "nose" (cf. e.g. Tzotzil *ni`(il)* "nose; in front of").

8.4. Sm **kitäntettə̑* / **kitə̑ntettə̑* "8" < **kitä tettə̑* "2 x 4" (SW 71–72).

8.5. The subtractive pattern 8 = 10 - 2 appears in SeT *šittį čāŋ köt* (Honti 1990: 105).

9.1. FV **ükteksä* "9" is evidently of the same structure as FV **kakteksan* "8" (see 8.1.). Traditionally it has been analyzed as **ükti* "1" + negation verb **e* + medial reflexive conjugation suffix **k* + Px3 Sg **sä* (UEW 807; Honti 1993: 110, 116). The final *-n* in Fi *yhdeksän* appears probably under the influence of *kahdeksan* "8" where *-n* represents the dual suffix. The alternative and evidently more convincing solution of V. Napolskikh based on the abessive suffix **-tkak* ~ **-tkek* for FV, and **-tkam* ~ **-tkem* for Pe numerals "8" and "9", was discussed above (8.1., 8.2.).

9.2. Pe **ȯkmi̯s* "9" (KESK 211; Honti 1993: 159) is of the same structure; see 8.2.

9.3. Ma **ănt-tāl-lŏγ*ʷ "9" = *"eine randlose (i.e. ohne den Randfinger seiende) zehn" (Honti 1990: 105 and 1993: 178–80).

9.4. Kh **ĕj-ĕrt-jɔ̆ŋ* "9" = *"einer vor zehn, eins-zusatzlich-zehn" (Honti 1990: 105 and 1993: 166–67).

9.5. Hu *kilenc* "9" < **kilen-tizə̑* *"zéhn mit Ausnahme von eins", cf. Hu *kívül, kül* "draussen, ausser" & *tíz* "10" (MSzFE 366; Honti 1993: 187–92).

9.6. Sm **ămājtɜm/nə̑* "9" is derived from the indefinite pronoun **ămāj* "anderer, zweiter" (SW 19), while the second component corresponds perhaps to Sm **ton* "Zahl" (SW 165), cf. Kamasin *amithun* "9" vs. "Abakan" *thun* "100".

9.7. MTK **op-tɜ-jäŋkɜ* "9" = *op* "1" + Px3 Sg **tɜ* + **jäŋkɜ* "is absent" (Helimski 1987: 77, 99; cf. SW 41).

9.8. SeT *ukkɨr čäŋka köt* "9" = "one is absent [from] ten" (Sm **jäŋkɜ* > Se *čäŋka*, see SW 40).

10.1. FiMd **kümeni* "10" (Keresztes 1986, 54; UEW 679) is comparable with Yukaghir **kümne-* "10" > Omok *kimnel*, YkNW *kunel*, YkS *chuniella* (Billings), *kunol(en)* (Klička), attrib. / predic. *kuni- / kunel'o-*, YkN *kunil'i / -kunal'-* (Tailleur 1959: 84; Krejnovič 1982: 117–118). Ankeria 1951: 138 also adds ItelmenS (Radliński) *kumhtuk* "10" (vs. *koomnak* "5").

On the other hand, Bouda (*UJb* 20[1940]: 89) assumed that the Yukaghir forms may be borrowed from Eskimo, cf. SWAlaska *qoln*, EGreenland *qulin*, WGreenland *qulit* "10", originally *"the top ones", cf. *quleq* "the uppermost" (Thalbitzer, *JAOS* 25/2[1908]: 8–9, 12). But Omok *kimnel* practically excludes this explanation and Yk **kümne-* represents a very hopeful cognate to the FiMd "10".

Čop, *Linguistica* 13[1973]: 147, 148 reconstructs FiMd **kümen* "10" interpreting **-n* as the dual suffix. The root **küme-* is supposed to correspond with IE **-ḱm̥* isolated from **deḱm̥* "10" = "2x5" (or "1 x 10", cf. Erhart 1970: 93–94; Winter 1992a: 17). But there is an alternarive etymology based on the verb **deḱ-* "to reach, accomplish", ruling out Čop's comparison.

There is also a possibility of internal etymology (cf. Majtinskaja 1979: 176) analyzing **kümeni* as a compound of the interrogative particle **ku* (UEW 101) + **mɜnɜ* "quantity, many" (UEW 279), cf. Komi *kɨmɨn*; Kamasin *kᵉшńєn*, Koibal *kumine* "how many" (KESK 152; SW 75) and YkS *xamun* id. (Angere 1957: 251). The component **mɜnɜ* forms tens (e.g. Komi *ńel'amɨn*, Ma *naliman*, Hu *negyven* "40"), and so it is natural to expect that it also forms the numeral "10". The semantical development "quantity/many" → ("number") → "ten" is plausible, cf. Semitic **ʕášar-* "10" vs. Egyptian *ʕšꜣ* "many, numerous; quantity, multitude". The shift "number" → "ten" appears in the following case (10.2.) too.

There are promising Altaic parallels: Tk: Čuvaš *mŏn* "big" // MKor *mānha-* "many, much", mKor *mantha* "to be many", *mān* "size, amount, number" (PKE 105–106) // OJp *mane-si* "much, many" < **mania-/*manai* (Starostin 1991: 94–95, 145, 276) and /or Even **mian* "10" (TMS 1: 534) // Kor *măn* "hand" (PKE 105). A hopeful cognate also appers in IE **men-/*mon-* "many, much", cf. Lithuanian *minià* "Menge" (Skalička, *UAJb* 41[1969]: 341).

The same component **mɜnɜ* could also form the numeral "20" attested in Md *kom(e)ś* "20", if the derivation **kojɜ* + **m[ɜn]ɜś* is correct (cf. KESK 150), and also perhaps Pe **kùź*, Ug **kuśī* "20" (S 544: FU **kuuśi*; UEW 224), accepting the same internal structure. In the first component U **koji* "man" has been identified (S 543; UEW 166–167; 224). But if the second member meant "10", **kojɜ* could represent another word for "2". Alternatively, the Pe-Ug isogloss could be explained as **kojɜ* "2" + plural marker preserved in Udm *-eś*, Komi *-ẹś* (Majtinskaja 1979: 83). The same pattern forming tens, i.e. the

cardinal of the first decad + plural marker, is known in some Semitic languages, e.g. Hebrew *ʕeśer* "10" vs. *ʕeśrīm* "20" etc. or Arabic *ʕašar* "10" vs. *ʕišrūna* "20" (Gray 1934: 69–70).

There are promising external parallels: Yk **kuj-/*kij-* > OYk **kijön* : (Bilings) *purchion*, (Klička) *purkijen* "7"; Čuvan (Boensing) *kujen*, *kujun* "2" vs. *imoxanbo kijon* "7", (Matjuškin) *kuen* "2" vs. *emganbagu kuek* "7"; YkN **kij-* "2" (Tailleur 1962: 70) // Mong *qojar / qogar* "2", *qorin* "20" (Anderson 1982: 44).

10.2. FU **luki* "10" has been derived from the root **luki-* "to count" (S 545) via the meaning "number" (Majtinskaja 1979: 175; UEW 253; Honti 1993: 121). Its traces can be seen in YkN/S (attrib.) *jeluku-/ileku-* "4" vs. *ja-* "3", indicating that "4" = "add 3" or sim. (Krejnovič 1982: 118; Jochelson 1905: 113).

Ankeria 1951: 137–38 compares FU **luki-* with Itelmen *lüx-* "Zahl, Rechnen", Čukči *lg-* "rechnen, zählen; Finger".

FU **luki* also has been connected with IE **leĝ-* "sammeln, zählen, lesen" (Joki 1973: 278–79 with older lit.). Illič-Svityč, *Ėtimologija* 1965[67]: 366 adds Mong *toga(n)* "Zahl, Rechnung", cf. also Manchu *ton* "Zahl" (TMS 2: 161–162).

10.3. Pe **das* (or **dăs*) and Hu *tíz* "10" are borrowed from some (M)Iranian source(s) (Joki 1973: 329–30, 257).

10.4. Kh **jəŋ* "10" has no convincing etymology. The hypothetical parallels or sources of borrowing quoted by Honti 1990: 103 (e.g. Tg **ǯuwan* "10" or rather some of later forms as Evenki *ǯāŋnā* "ten objects" — TMS 1: 248) can be supplemented by Turkic dial. forms, like OKipčak *ong*, cf. Osman dial. *uṇ*, *ōṇ*, Čuvaš *vun*, *vun(n)ă* "10", etc. (Sevortjan 1974: 455). The unclear initial **j-* can be of later origin. A similar prothesis appears more frequently before front vowels in Ob-Ugric, cf. Kh **jil* "vorder" < U **eδe* "das Vordere" (Honti 1982: 71; UEW 71–72). The hypothetical source of Kh "10" could be the form of the type **ön*. But the front vocalism does not apper in any historically attested Turkic language.

10.5. MT *ǯuen* "10" (Helimski 1987: 77) is undoubtedly of Tg origin, cf. Nanai *ʒoan*, Sibo *ǯuan*, etc. < **ǯuwan* "10" (Benzing 1955: 101; TMS 1: 248).

Note: There are some local innovations for "10" too: (i) LpS *tsiekkie* "10 (beim Zählen der Rentiere)", orig. "Einschnift, Einkerbung; Rentierohr-marke: kleiner, halbrunder od. nahezu kerbschnittförmiger Ausschnitt"; (ii) Udm *don*, *ton* in tens (40–90), orig. "Preis, Wert"; (iii) SeT *sar* in tens (20–80), orig. "Bündel", cf. also "Abakan" (Strahlenberg) *šerm* in *tušerm* "20" (Honti 1990: 104–05).

§3. Conclusion

The most promising cognates of the first decad and the related words in Uralic and other Northern Eurasian language families are distributed as follows:

no.	root	FU	Sm	Yk	Tk	Mo	Tg	Kor	Jp	Nivx	ČK	Dr	IE
1	**ük-*	+	?+	(+)	(+)			(+)	(+)				
	**op-*		+			?(+)	(+)	(+)					
	**oj-*	?+	+				(+)	(+)	(+)				+
2	**ket-/*kat-*	+	+	+					(+)		?+		(+)
	**koj-*	*		+		+							
3	**gur-*	+	?+			+		*	*		(+)		
4	**ńel-/*ńal-*	+				*	*	+		?+		+	
5	**wi(t)t-*	+	*					+	+				
10	**kümɜn-*	+		+							(+)		
	**mɜn-*	+		(+)			+ / *	(+)					(+)
	**luk-*	+		*									(+)

Note: The symbol (+) means that the meaning is not a simple numeral, e.g. Kor *oi, ö* "only, a single", *oi-nun-thoŋi* "one-eyed person". The symbol * is used for non-corresponding meanings of numerals, e.g. FU **ńi/neljä* "4" vs. Tg **ńöl( )ǯu-* "6" (= "10 — 4" ?).

This cognate set reflects the East (North) Nostratic level, approximately corresponding to J.H. Greenberg's Eurasiatic. The material correspondences among numerals indicate a closer relationship among Uralic, Yukaghir and Altaic (including Korean and Japanese) within (East / North) Nostratic.

The internal evidence and external parallels allow us to reconstruct the proto-Uralic numeral system consisting of the numerals 1–5. Although there are no evident Sm cognates to FU **ńeljä* "4", the probable foreign origin of the Sm "4" (< Tk) and the external evidence justify projecting this numeral onto the proto-Uralic level. The FU and Sm numerals "6" differ etymologically, but are formed on the basis of the same semantical pattern. The numeral "7" is borrowed from various IE branches (Baltic, Indo-Iranian, Tocharian). The numerals "8" and "9" represent the subtractions "10–2" and "10–1" respectively, perhaps with exception of the Ug "8" analyzable as the dual of the numeral "4". Among various denotations of the numeral "10", the FiMd **kümeni* seems to be the most archaic, given proto-Yukaghir **kümne-* "10". The counting system with firmly established numerals 1–5 and 10 looks perhaps as illogical to Europeans, but it is well-known e.g. in Bantu languages. It does not mean the numerals 6–9 did not exist in proto-Uralic; they could be formed (and were formed) through the existing numerals 1–5 & 10 and elementary arithmetic operations.

Abbreviations: Alt Altaic, BF Balto-Fennic, ČK Čukči-Kamčatkan, Dr Dravidian, E East, Fi Finnish, FP Fenno-Permic, FU Fenno-Ugric, FV Fenno-Volgaic, Hu Hungarian, IE Indo-European, Jp Japanese, Kh Khanty (= Ostyak; with dialects: I Irtyš, Kaz Kazym, V Vach), Kor Korean, Lp Lappic, m modern, M Middle, Ma Mansi (= Vogul with dialects: KU lower Konda, TJ Tavda of Janyčkova), Md Mordvin, Mong Mongolian (written), Mr Mari, MT(K) Mator-Taigi(-Karagas), N North, O Old, p proto, Pe Permian, S South, SeT

Selkup Taz, Sl Slavic, Sm Samoyed, Tg Tungusian, Tk Turkic, U Uralic, Udm Udmurt, Ug Ugric, W West, Yk Yukaghir.

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MSFOu *Mémoires de la Société Finno-Ougrienne.*
MSzFE *A magyar szókészlet finnugor elemei*, 1–3. Budapest: Kiadó 1967, 1971, 1978.
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NyK *Nyelvtudományi Közlemények.*
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ALTAIC NUMERALS

For Karl H. Menges to his 90th birthday (April 22, 1998)

The Altaic hypothesis supposes a genetic relationship of Turkic, Mongolian, Tungus, Korean and Japanese. One of the most frequent arguments of its opponents (Clauson, Ščerbak) is based on an imaginary absence of common numerals. The presence of common (= inherited) numerals represents certainly an important argument for a genetic relationship. But its absence has no declaring value — there are more safely related languages without any related numerals. The recent progress in a comparative historical phonology of Altaic languages allows to identify more inherited numerals and to differentiate them from the numerals of substratal or adstratal origin.

The most promising set of regular correspondences among Altaic branches and the reconstruction of the Proto-Altaic consonantism was made by Starostin (1986: 104 and 1991: 21) and Vovin (1994: 100):

Rule	Proto--Altaic	Proto-Turkic	Common Mongolian	Proto-Tungus	Middle Korean	Proto-Japanese
1.	*p^h	*Ø-, *-p-	*φ > h-, -b-	*p	p-, p(h)	*p
2.	*p	*b	h-, -γ- / -w-	*p-, *-b-	p-, -w-	*p-, -m-
3.	*b	*b	b-, -γ-	*b-, *-w-	p	*p / *b (-m-/-γ-)
4.	*-w-	*-b- / *-Ø-	-b- / -γ-	*-w- / *-y-	-Ø-	*-w- / *-Ø-
5.	*m	*b-, *m	m	*m	m	*m/ *-Ø
6.	*t^h	*t	t, č(i)	*t, *čį-	t-, t(h)	*t
7.	*t	*d-, *-t-	d, ǯ(i)	*d-, *ǯį-, -t-	t-, -r-	*t / *d
8.	*d	*j-, *-d-	d, ǯ(i)	*d, *ǯį-	t-, -r-	*t / *d, -y- / -Ø-
9.	*n	*j-, *-n-	n	*n	n	*n / *-Ø-
10.	*-r_1-	*-r-	-r-	*-r-	-r-	*-t- / *-r- / *-Ø
11.	*-r_2-	*ŕ > *-z- ~ Ch -r-	-r-	*-r-	-r-	*-t- / *-r-
12.	*l_1	*j-, *l	n-, l	*l	n-, -r-	*n-, *-r-, *-Ø
13.	*-l_2-	*ĺ > *-š- ~ Ch -l-	-l-	*-l-	-r(h)-	*-s-
14.	*s	*s	s	*s	s- / h-, s	*s
15.	*š ?		s	*š		
16.	*z ?	*j	s	*s	s-	*s
17.	*$č^h$	*č	č	*č	č-, č(h)	*t
18.	*č	*d-, *-č-	d-, -č-	*ǯ-, *-s-	č	*t-, *-s-
19.	*ǯ	*j	ǯ	*ǯ	č	*d-, *-y-, *-Ø
20.	*ń	*j-, *-ń-	n	*ń	n-, -ń-	*n- / *m-, *n, *-Ø

Rule	Proto-Altaic	Proto-Turkic	Common Mongolian	Proto-Tungus	Middle Korean	Proto-Japanese
21.	*-y-	*-j-	-y-	*-y-	-y-	*-y-
22.	*k^{h}	*k-, *-k- / *-γ-	k-, -k- / -γ-	*x-, *k	k/h-	*k
23.	*k	*g / *k	k-, -g-	*k-, *g	k-, -h- / -Ø-	*k
24.	*g	*g	g-, -γ-	*g	k-, -g-/-h-/ -Ø-	*k-, *-w-/*-y-/*-Ø-
25.	*ŋ	*Ø-, *-ŋ	*Ø-/g-, -ŋg-/-γ-, -n	*ŋ	n-/Ø-, ŋ/Ø	*n-/*m-/*Ø-, *-m-/*-n-

Note: 1) Starostin 1991: 119–120, fn. 13 postulates the palatalized reflex *č(i)*-; our objections are explained in #20.

Turkic numerals

The Proto-Turkic reconstructions follow Mudrak (1993), including his specific transcription of proto-phonems (Mudrak ~ Starostin / Vovin): *t-* = *d-*, *t'-* = *t-*/*t^{h}-*, *ć* = *č*, *ʒ́* = *j* etc.

	Proto-Turkic modified after Mudrak 1993	Volga-Bolgarian Benzing 1959	Chuvash Baitchura 1994 weak	Chuvash strong	Old Turkic Kononov 1980	Khalaj Doerfer 1971
1	*bĭr	*bir	pĕr	pĕrre	bir	bī
2	*ẹkki	*iki	ik(ĕ)	ikkĕ	iki, ẹki	ākkü / ākki
3	*ü'č	*večim "3rd"	viś(ĕ)	viśśĕ	üč	ūš / Ič
4	*dörtʌ	*tüät	tăvat(ă)	tăvattă	tört	dörrt / d'rt
5	*bĕš'k	*biäl	pilĕk	pillĕk	bẹš, biš	bī'š
6	*altı	*altï	ult(ă)	ultă	altï	alta
7	*ʒ́et(t)i	*jüäti	śič(ĕ)	śičče	jiti, jẹti	yāti
8	*sek(k)iŕ	*säkir	sakăr	sakkăr	sẹkiz	säkkiz
9	*tok(k)uŕ	*toxur	tăhăr	tăhhăr	toquz	toqquz
10	*ōn	*van	vun	vunnă	on	ū'n
20	*ʒ́ẹgirbi	*jiärim	širĕm		jẹgirmi, jigirmiś	yigirmi
30	*ottuŕ–*oltuŕ	*votur	vătăr		otuz	hottuz
40	*k'ir'k – *k'	*qĭrq	hĕrĕh		qĭrq	qĭrq
50	*el(l)ig	*älü	allă		ẹlig, ilig	ālli
60	*altbiŕ		utmăl		altmïš	altmīš
70	*ʒ́etbiŕ		śitmĕl		jẹtmiš, jitmiš	yātmiš
80	*sek(k)iŕ-ōn		sakărvun	sakărvunnă	sẹkiz on	seʃ(x)san
90	*tokkuŕ-ōn	*toxur-van	tăhărvun	tăhărvunnă	toquz on	Doxsan
100	*ʒ́ŭŕ	*jür	śĕr		jüz	yŭz / yi·z

Comparative-etymological analysis

1. Tk **bĭr* "1" is usually compared with WrMo *büri*, Khalkha *bür* etc. "each, all" (Ramstedt 1907: 5). Miller 1971: 230 adds OJp *pito-tu* < **pitə* and MKor *pĭrĭś*, *pĭrĭsó* "at first; to begin". Starostin, Dybo & Mudrak reconstruct pAlt **büri*. See also Starostin 1991: 99, who prefers **birV*.

Tenišev 1978: 110 connects Tk "1" with **barmak* "thumb". Čanyšev 1985: 78 adds Tatar *birgï* "near" and OTk *berü* "hither". His comparison with IE **perH₂-* "front, first" is doubtful.

2. Tk **ẹkki* "2" has not any safe etymology. Ramstedt 1949: 195 compared it with Kor *pẹgịm* [= *pəkím*] "the next, the following, the one following" (with the same suffix as *čẹgịm* "the first"). Starostin 1991: 284 adds OJp *p(w)oka*, Ryukyu *fòká*, Tokyo *hòka* (**pəka*) and reconstructs pAlt **p'ek'V*. The expected semantical development is plausible, cf. Latin *secundus* "2nd" vs. *sequor* "I follow". But the initial pAlt **p'-* implies *h-* in Khalaj, an archaic Turkic language from Iran. And here only the form *äkki* is attested (cf. Doerfer, *OLZ* 66[1971]: 439). But it is possible to etymologize this numeral on the basis of the same semantic motivation. In **-ki* the suffix of ordinals can be identified, cf. Tuvin *birgi, ijigi, üškü, bëški* "1st, 2nd, 3rd, 4th, 5th", OTk *baštiŋkï* "1st" (Ščerbak 1977: 151). A hypothetical primary root can be found in the verb **eg-*, cf. **eg-er-* "to follow" > Chagatai *eger-*, Uzbek *egir-*, and with another extension Lobnor *ej-eš-* ; a simple root probably appears in OTk *iv-* "to follow" — see Sevortjan I: 242 (the phonetic development has an analogy e.g. in OTk *övür-, öwür-* vs. Uzbek *ọgir-* "to turn", see Sevortjan I: 498–499). A connection between **ẹkki* "2" and **eg-(er-)* was already anticipated by Vámbéry (see Sevortjan I: 245) and recently Tenišev (1978: 112). The attempt deriving the numeral from the verb **ek-* "to sow" (Čanyšev 1985: 78 following Vámbéry, cf. Sevortjan I: 252) is not convincing for semantical reasons.

In principle, at least as an alternative, an Iranian origin must also be taken in account, cf. Modern Persian *yek dīgar* "one second", *yek yek* "one each", Zoroastrian Pahlavi *ēk ēk*, Yaghnobi *īki īki* "one by one" (Emmerick 1991: 334–335).

3. Tk **ü'ć* "3" (traditionally **ǖč* — see Räsänen 1969: 518) is also rather puzzling. Ramstedt 1907: 9 compared it with WrMo *üčü-ken* "small", related to Tg **ŋūči-kūn* id. (Starostin 1991: 18, 43), explaining "few" > "3" (or vice versa !). Čanyšev 1985: 79 connects **ǖč* with **ūč* "end, point, edge, beginning" (Sevortjan I: 612–613). Semantically it is really possible, cf. e.g. Dravidian **muṉ-* "3" derived from **muṉ-* > Tamil *muṉ* "in front, prior", *muṉai* "front, face, point, sharpened end, edge" etc. (Andronov 1978: 242; DEDR 5020, 5052). The semantic motivation could look as follows: "protruding (finger)" > "middle-finger" > "three". But the different anlaut in Khalaj *hūuč* "end" vs. *ǖš/īč* "3" excludes this etymology. In Lamut dialect of Kamchatka Bay Messerschmidt recorded a unique form *üttan* "3" (Anderson 1982: 53). If it is not just a misprint (cf. *ullan* by Strahlenberg 1730), it could reflect an original **üt-lan* or even **üč-lan*, fully compatible with Tk **ǖč*. The internal structure can also be recognized here. There was a suffix of ordinal numerals **-č(i)* attested in a simple form in Chuvash *-š* (*pĕrĕš* "1st"), perhaps in Yakut *-s* (*ikkis* "2nd", *ühüs* "3nd", *uon bīris* "11th" etc), and in the Common Turkic compound suffix of ordinals **-inč(i)* (Ščerbak 1977: 144–150). The development could look **ut-* & **-č(i)* > **ǖč*. The meaning "3" may not be the oldest. Gordlevskij (1945: 141) demonstrated that in Kyrgiz, the form *uč* appears in children's games in the meaning "5". In the game imitating a fight for the

main tent of the Qaγan, the idiom *qьrqtьn ucu* "200" = "40 x 5" was used. If the meaning "5" was primary, the numeral **üč* resembles very suggestively Kogurjŏ *üc//utu* and pJp **itu-* "5" (see Japanese numerals, # 58).

There is again a possibility of Iranian origin, cf. Buddhist Sogdian *ʔšty-* & *čšty-*, Khwarezmian *šy* "3" (Emmerick 1991: 321). A similar sound substitution is known e.g. from Ujgur *učmaq* (but OTk *uštmax*, *učtmax*, Chuvash *šătmaχ*) "paradise" < Sogdian *ʔwšt̰mʔχ* (Sevortjan I: 614).

4. Tk **tȫrtʌ* "4" = **tȫrd* (Poppe) = **tȫrt* (Räsänen) = **dȫrt* (Dybo) has been compared with Mo *dörben,* Tg **dujgin* and pJp **də-* "4" (Ramstedt 1907: 7–8; Hamp 1970: 194; Miller 1971: 220–221; Miller 1996: 116 adds the puzzling early MKor *towi* etc. "3", corr. "4", recorded in Japanese *kana*-syllabic script — see # 46). The final dental can perhaps be identified with the plural-collective marker attested in OTk *-t* (cf. *oγlït* "descendants" — Kononov 1980: 147). An indirect evidence can be found in Mo *gučin, döčin* "30", "40" < **gurtin, *dörtin* (cf. also Kyrgiz *qьrqtьn* "40" quoted above). Hamp (1970: 194) reconstructs even pMo **gurt-guan* "3" & **dört-guan* "4" with **-t-*. Poppe 1960: 110 assumed that the only regular correspondence to Mongol-Tungus **d-* is Turkic **j-*. He concluded that the Tk numeral must be borrowed. Starostin, following the idea of Illič-Svityč and Cincius about three series of occlusives, postulates the response nr. 7 (see above) and reconstructs pAlt **tōr ~*tūr* (1991: 71). More about a possibility of an inner Altaic etymology see # 22. Čanyšev 1985: 79 rejects the traditional Altaic comparanda and offers his own solution based on the identification of the final **-t* with the last syllables **-tï/*-ti* of the numerals "6", "7", postulating their original meaning "finger". The root proper has to be related to **tȗr-* "zusammenrollen" (Räsänen 1969: 506). Doubtful.

There is again an alternative to seek an Iranian origin of this numeral, cf. Old Iranian **(x)turĭya-* > Avestan *tūiriia* "4th", *āxtūirīm* "four times". But the form **turθa-* (Bartholomae), much more resembling Tk **tȫrtʌ* did not exist in Iranian (Emmerick 1992: 321–324).

Róna-Tas (1974: 504) tried to identify the source of Tk "4" in Tocharian B *śtwer* "4"(similarly the numerals 5, 7, 8, 20, 10000 should have also been of Tocharian [B] origin).

5. Tk **bĕ̄ɬk* "5" reconstructed by Mudrak (1993: 94 - 95; his comparison with IE **penkʷe* is doubtful) solves better the difference between Common Turkic **bēš* and Chuvash *pil(l)ĕk* than the reconstructions of other authors (Räsänen: **bā̄š*, Doerfer: **bêš*, Sevortjan: **bę̄š*, Serebrennikov & Gadžieva : **bə̄š-* < **bə̄l-*), and at the same time confirms the old comparison with Tk **bilek* "wrist, forearm, arm"// Mo *bile* "wrist", Kalmyk *bülkŋ* "forearm" < **bilüken //* Tg **bile-(ptun)* "wrist" (Ramstedt 1907: 12–13; Poppe 1960: 117; Räsänen 1969: 76; Sevortjan II: 126, 145–146), cf. yet MKor *phàr* "arm" < **pàrh* (Starostin).

Benzing 1959: 731 sees in the Tk "5" an Iranian borrowing (cf. Persian *panǰa*). Concerning the final *-k* in Chuvash, he finds an analogy in Urdu *pančak* "the group of 5". Róna-Tas 1974: 502 derives Tk **bēš* from Tocharian B *piś* "5".

6. Tk **altï* "6" has not an unambiguous etymology either. Ramstedt (1907: 15) sees in this word an alternative name for "thumb" derived from **al-* "to take", similarly as **barmak* "thumb, finger" can be connected with Mo *bari-* "to catch". Čanyšev (1985: 80) presents a modification "take a finger" on the basis of his fictive **tï* "finger". Hamp (1974: 675–676) analyzes the numerals **alt-bił* "60", **ǯet-bił* "70" as "the first after 50", "the second after 50", identifying **alt-* with OTk *alt* "bottom", *al* "side", *alïn* "forehead"; cf. Chagatai *al* "front side" (Räsänen 1969: 14; Sevortjan I: 124). It would mean "6" = "[1] before [5]". This point of view can be supported: if Mudrak, reconstructing Old Bolgarian **etə* "5", is right, the second component of this numeral can be identified with the Old Bolgarian "5" (the same can be said about the following numeral "7").

7. Tk **ǯet(t)i* "7" = **jätti* (Starostin) = **θätі* (Ščerbak) = **dêttē* (Doerfer) is also without any convincing etymology. Starostin (1991: 141) adds Tk **jätti* (< **jäddi* ?) to Tg **nada-n* and OJp *nana-* "7" without any deeper etymological attempt. Ramstedt (1907: 16) connects the numeral with the verb **ǯē* "to eat" (Räsänen 1969: 194), seeking an analogy in Mo *doluγan* "7" vs. *doluγa-* "to lick". Hartman (*Keleti Szemle* 1[1900]: 155) reconstructed **jet-di.* Supposing a specific role of the numeral "7", he derived it from the verb **jet-* "erreichen, genug sein" (Räsänen 1969: 199).

In the first component of the numerals "7", "70", Hamp (1974: 675–676) sees a regular Turkic counterpart of WrMo *jitüger* "the second wife in a bigamous family" (but *-t* is an integral part of the suffix, cf. *γu-tuγar* "3rd" etc.).

Róna-Tas (1974: 500) admits that a hypothetical connection of Tk "7" and pre-Tocharian B **seɣte* "7" is very problematic.

8. Tk **sek(k)iř* "8" is segmentable in **ek(k)i* "2" & **-ř* 'dual marker'; for the initial **s-* the meaning "without" can be expected. Its direct traces are not evident in Turkic, but the negative verb in Mongolian and Tungus represent a hopeful evidence (Ramstedt 1907: 16–17): WrMo, MMo, Urdus *ese*, Daghur *ȩs*, Monguor *sȩ* etc. "not to be" (Poppe 1955: 287–288)// Ewenki *ȩsin-* "not to be", Olcha *-asi-/-ȩsi-* etc. (TMS II: 432; Poppe 1960: 65). Ramstedt 1982: 51 adds Kor *ȩtta :ȩsȩ : ȩsȷ̇n* "to be contrary, be sideways", cf. WrMo *esergü* "contrary", *esergüče-* "to oppose"; Miller (*CAJ* 29[1985]: 45) finds further OJp *ese* "wretched, miserable, worthless, displeasing, poor". A hypothetical cognate in Turkic can be identified in the word-pair **äs-irkä-* vs. **irk-*, cf. MTk *äsirgä(n)* "sich über einen Verlust betrüben", Azerbaijan *äsirgä* "nicht gern geben" vs. MTk *irk* "sammeln" (Räsänen 1969: 50, 173). Cf. also the

OTk negative suffixes *-siz, -sïz, -suz, -süz, -sul* (Kononov 1980: 107; Menges, *CAJ* 18[1974]: 198).

9. Tk **tokkuř* "9" = **tokkaz* (Doerfer) = **toqyz* (Serebrennikov & Gadžieva) = **dokkəz* (Dybo) is compatible with Tg **togar* "span; четверть (measure)" (TMS II: 190–191) and WrMo *töge*, Khalkha, Buriat, Kalmyk *tō̄* "span (between thumb and middle finger) (Ramstedt 1935: 408); cf. also Tk **t/dogar* "ausspannen" (Räsänen 1969: 483). More about the connection of the verb "to stretch" with denotations of spans and consequently numerals in Indo-European see Schmid 1989: 23–24 (cf. IE **tens-* "to stretch": Old Indic *vitasti-* "span" or Slavic **pьnǫ pęti* "to stretch" : **pędь* "span", similarly Lithuanian *kẽsti, kečiù* (**kʷetyō*) "ausbreiten, ausspannen" vs. IE **kʷetwŏr-* "4", originally perhaps "span"). Ramstedt 1907: 17 assumed a connection with WrMo *toγa* "number" without any further explanation. Miller 1971: 236 quotes the opinion of Lee about a connection of Tk "9" and Kogurjŏ *tę(k)* "10". Later Ramstedt (1957: 66) compared Tk "9" with Mo *toqur ~ tokir* "with inflexible fingers" (Ramstedt 1935: 398). Burykin's comparison of Tk "9" and WrMo *doluγan* "7" (1986: 30) is quite doubtful.

10. Tk **ōn* "10" resembles suggestively MKor *ón* "100" (Ramstedt 1949: 177), cf. Tg **ǯuwan* "10" vs. WrMo *ǰaγun* "100", and the OKor (pSilla) suffix of tens **-on /*-un* (Krippes 1991:149). Ramstedt 1907: 20 also connected Tk "10" with the suffix *-an* of tens in Mongolian, demonstrating the process of the change **-on* > **-an*. The primary meaning can be reflected in MMo (Secret History) *ono-* "zählen" (Haenisch 1939: 125), compared with WrMo *onu-* "verstehen, das Ziel erreichen, treffen", Even *u̇nu̇-* ~ *ōnu̇-* ~ *ōno-* "to understand, think" (Poppe 1960: 70; TMS II: 275). On the other hand, there is Tg **oṅō* "picture, ornament" (TMS II: 20), semantically comparable with MMo *har* "ornament", metaphorically perhaps "sign" > "number" (?) — cf. # 28. Ramstedt's attempt to include here also WrMo *on* "year", must be rejected not only because semantics (1 year = 12 months), but also for phonetic reasons (pMo **φon* > MMo *hon*, Monguor *fān*, *χuan*, Khitan *po* — see Ligeti, *AOH* 10[1960]: 237–238; Kara 1990: 298); Mo > Manchu *fon* "time" // Kor *pom* "spring" with *p-* absent in *ón* "100" — see Poppe 1955: 30; Id. 1960: 155; also Khalaj *ū̊n* "10" without the expected *h-* excludes this comparison). Čanyšev 1985: 81 (cf. also Hamp 1974: 676) compares Tk **ōn* "10" with *oŋ* "right" ("10" = "right hand ready" ?), referring to Old Kypchaq *ong* "10" (Sevortjan I: 455–460).

11. Tk **ǯęgirbi* "20" has usually been reconstructed with medial **-rm-*, cf. **θiγ'irmä* ~ **θäγ'irmä* (Ščerbak), **ǯęgirmi* (Mudrak). Serebrennikov & Gadžieva 1979: 127–128 reconstruct **jiγ'irbə* esp. on the basis of Yakut *sū̄rbə*, Shor *čegirbe*, Tuvin *čērbi*, Lebedin *jägärbä* etc. (cf. Sevortjan IV: 202; Poppe 1960: 87 about the tendence **-rb-* > **-rm-* in Turkic). The priority of

the cluster **-rb-* confirms the hypothesis of Ramstedt (1907: 21) connecting the segment **-Vrbi* with WrMo *arban* "10" and a hypothetical Tg formant of tens **-arma-gi* > Solon *nadarangí, -inγí* "70", *ʒabkorinγí* "80" etc. Later Ramstedt (1957: 66) offered a different solution: a comparison with MMo (Secret History) *ǰi'ürme-de-* "to double" <**ǯiγür-*. But Haenisch 1939: 91 translates MMo *ǰi'ur-me-* "noch zunehmen, noch schlimmer (stärker) werden". Regarding the existence of a parallel numeral for "20" in Turkic (**ikōn* reconstructed by Ščerbak 1979: 139) with a transparent internal structure (2 x 10), the form **ʒẹgirbi* can represent a compound of originally Mongolian words **ǯiγür-(me-)* & **[φ]arba(n)* "double ten". Hamp 1974: 676 connects the Tk numeral "20" with *jigit* "youth, young man", postulating **jig-* "new, fresh". This explanation of the semantic motivation ("new" = "next ten" ?) is not convincing.

12. Tk **ottuř ~ *oltuř* "30" (Mahmud Kašgari had also recorded the meaning "3" — see Sevortjan I: 489) has no safe etymology. Hamp 1974: 676 proposes a dissimilation from **ortuř*, a derivative of **orta* "middle", supposing "middle (finger)" > "third (decad)". There are additional facts supporting and precizing just this solution: (1) The stem *orta* is really used for a denotation of the "middle finger": Sary-Yugur *urtamaq*; Kyrgiz, Kazakh *ortan qol*, Teleut *orton qol* (Sevortjan I: 476–477); (2) The forms each as Uygur *ot(t)ur, ottura*, Lobnor *ottoyo*, ? Chuvash *varri* "centre" (Sevortjan I: 474–475) differ from the variant **ottuř* only in final *-r//-ř*. But this attractive etymology must be rejected because of a different anlaut in Khalaj *hottuz* "30" vs. *o·rta* "middle".

Ramstedt 1957: 66 connected the Tk "30" with Kor *pottări* "bundle, knot", although the semantic motivation remains puzzling. This comparison implying an original Alt **pʰ-* can be supported by the reconstruction of pre-Tk **p-* based on Khalaj *hottuz* (Doerfer, *OLZ* 66[1971]: 326 reconstructs Tk **pottaz*).

13. Tk **k(ʻ)ɨrk* "40" is again without any unambiguous etymology. Halévy 1901: 40 speculated about a multiplication **ẹk(k)i-ř ʒẹgirmi* "2x20" > **kʻɨřg* > **kʻɨrk*, cf. the innovative formation of the same internal structure in Balkar *ëki ǰǰïrma* "40" = "2x20" (Ščerbak 1977: 141 also quotes other examples of traces of the vigesimal system, e.g. Old Azerbaijan *iki ǰǰïrx* "80" = "2x40"). Hamp 1974: 676 seeks a source in Tk **kïr* "edge" (Kazan Tatar, Teleut), usually "mountain (ridge), shore, bank", even "field, steppe", while the derivative **kïrïg* has the meaning "edge, side, border" (Räsänen 1969: 265–266). Hamp proposes a semantic motivation "edge (of the hand)" > "4(0)". This semantic interpretation can be supported, if our etymology of pAlt **dör[i]* "4" is correct (# 22). Hamp's alternative attempt connecting the numeral with **kïřa-* "be short", **kïřïk* "narrow" ("short finger" > "4(0)") is not more convincing.

14. Tk **el(l)ig* "50" has been connected with Tk **el(ig)* "hand" and **el(l)ig* "breadth of the finger / of the palm of hand" (?) (Sevortjan I: 260,

263–264, 266–267; Ramstedt 1907: 13 also quotes Uryanchi *ăldik* "glove"; Gordlevskij 1945: 135; Räsänen 1969: 39; Hamp 1974: 676); *-lig* is probably an adj. suffix (Räsänen; Schott 1853: 18 saw in Tk **-lig* a counterpart to Fenno-Ugric **luki* "10"). The deviated form *ittik*, appearing in Zenker's *Dictionnaire Turc-Arabe-Persan, I (Leipzig 1866), 8* and Vel'jaminov-Zernov's *Slovaŕ Džagatajsko-Tureckij (1868)* is isolated and perhaps wrongly recorded (Radloff I: 824). On the other hand, it suggestively resembles Old Bolgarian **etə* "5" (Mudrak p.c.) // Kogurjŏ **utu*, pJp **itu* id. (cf. # 57).

15. Tk **alt-bïł* "60", **ʒet-bił* "70" (usually reconstructed **alt-mïl*$_2$, **jet-mil*$_2$, but Kazakh, Karakalpak, Nogai *alpïs* "60", Kazakh, Karakalpak *žetpïs*, Nogai *jetpis*, Karakyrgiz *jetpiš* "70" confirm **b* instead of **m*, cf. also Serebrennikov & Gadžieva 1979: 127) consist of two components: (1) the stem identical with the numerals "6", "7"; (2) the stem, which can be identified with the numeral "5". Probably the most convincing solution was presented by Hamp (1974: 675): **alt-bïł-ōn* "(1st + 5) x 10" or "the first (decade) after 50" > **alt-bïł* "60" **ʒet-bïł-ōn* "(2nd + 5) x 10" or "the second (decade) after 50" > **ʒet-bïł* "70". The parallel formation **bił-ōn* "50" really exists, cf. Osman Turkic *beş on* (in Laws of Sulaiman the Magnificent, 16th cent.), Sary Uygur *pis'on*, Shor *pĕžon*, Altai, Tuvin *bĕžĕn*, Tofalar *bĕžon*, Yakut *biës uon* (Gordlevskij 1945: 136, 138; Ščerbak 1977: 140). The idea connecting the formant **-bił/-bïł* with **bĕ̄łk* "5" was probably first formulated by Dəmirčizadə (1968) — see Sevortjan I: 141 including the other etymological attempts.

A new etymology was proposed by Miller (1996: 145). He compares Tk **-mïl*$_2$ with Kor *-mĭr* in *sïmĭr* "20" (see #44), mentioning also NKor *mŭs* "(a bundle of) ten (sheaves, fish, etc.), a plot of land from which ten sheaves of tax-grain are collected".

16. Tk **sek(k)iř ōn* "80", **tokkuř ōn* "90" are also preserved as separate forms in the monuments of 8th cent. (Türkü, Uyghur and Manichean dialects). Only from 9th cent., a contraction appears, cf. Xakani *seksō̄n*, *toksōn* (Clauson 1959: 20).

17. Tk **ʒū̄ř* (Mudrak) = **jū̄ř* (traditionally) "100" resembles MKor *'yərh* "10" (Lee) = *jər* "10", *jərəh* "a big quantity, number" (Starostin) // OJp *yòrò-du* "10 000"; pMo **yersün* "9" may also belong here (see # 27); if it is etymologically connected with WrMo *yerü* "the most of ..", *yerüdügen* "generally, for the greatest part", *yerüŋkei* "common; public" (Ramstedt 1982: 62), the original meaning could have been **"the greatest [number]" (cf. # 27) . This semantic reconstruction remarkably corresponds with the reconstruction **jüz-on* (=**ʒū̄ř-ōn* after Mudrak), proposed already by Ramstedt 1907: 19 (cf. # 52). Starostin, Dybo & Mudrak 1995, n. 265 reconstruct pAlt **jEŕV **"a big number", i.e. **yeřü* in our notation, taking in account also the Mongolian data.

Miller 1971: 211–215 derives Tk "100" from pAlt *$d\bar{u}$-r_2, lit. "tens", and compares it with Tg *ǯuwan "10" < *dшwan (not explaining *d-) and OJp *töwö* "10". Menges 1968b: 97 presents a comparison of Tk "100" with Dravidian *$n\bar{u}ɾu$ "100", deducing pAlt *ñüri/*ñürü.

Mongolian numerals (modified after Poppe 1955: 242–250; Anderson 1982: 44, 47)

1 *niken > Ancient Mo, MMo *niken*, Daghur *nikę, nękę*, Shirongol-Wuyangpu *nike*, Mogol *nikän*, besides WrMo *nigen*, Khamnigal *nege(n)*, Urdus *nege*, Kalmyk *negn̨*, Monguor *nige* etc., and WrMo *niǰi-ged* "each one"; cf. also a modern Chinese reading *nai* of the Khitan gloss "1" (Starikov 1982: 149). But Doerfer 1992: 48 connects it with WrMo *naǰ* "sehr".

2 *qowī-ar > MMo, WrMo *qoyar*, Khamnigal *koir*, Daghur *xo(y)ir*, Khalkha *xoyor*, Mogol *qoyōr*, etc., cf. *qo( )r-in "20" > MMo, WrMo *qorin*, Khamnigal *kori(n)*, Monguor *xorin/m* etc. "20"; the archetype *qoɣar > WrMo *qoɣor(undu)*,Urdus *χōrondu* "between" continues also in Shira Yogur *qur*, Kachug Buriat *χōr*, San chuan *qor*, Monguor *g̨ōr* etc. "2"; cf. also a modern Chinese reading of the Khitan gloss *χə*, *χo* "2" (Starikov 1982: 125). Vladimircov 1929: 276 adds WrMo *qobu-sun* "two-years-old boar" < *qowu- and Oirat (Bayit) *xoĭ-mstā* "two-years-old" < *qoyï- < *qowï-.

*ǯi( )r-in > MMo (Secret History) *ǰirin*, WrMo *ǰiren* "two (about women)"; Monguor *ǯür*, Daghur *ǯūr(ūi)* "pair" < *ǯirü(gü) (if these forms are not borrowed from Solon *ǯūr* "2" — see Todaeva 1986: 145), cf. also WrMo *ǰitüger* "the second wife in a bigamous family" vs. *ǰitüge* "competition"; *ǰöbe-ger* "one of two", Urdus *ǯöwō̄r*; WrMo *ǰirmusun* "pregnant" (cf. *dabqur* "double" & "pregnant"); Wr Mo *ǰiči* "again" vs. *ǰiči* "great-grandson" = "descendant of the second generation" — cf. *ɣuči* and *döči* for the third or fourth generation of descendants — see Kotwicz 1962: 138–139; (Poppe 1955: 243–244; Ramstedt 1957: 65; Poppe 1960: 28; Starostin 1991: 33 reconstructs pMo *ǯiw-rin*).

3 *ɣur-ban > WrMo *ɣurban*, MMo *ɣurban & qurban*, Shira-Yogur *gurban*, Shirongol-Punan *gurbon*, Mogol *ɣurbōn*, Monguor *g̨urān* etc., cf. *ɣurtin "30" > WrMo *ɣučin*, Shira-Yogur *gučön*, Khamnigal *guci(n)*, Monguor *xoǰin* (an influence of *xorin* "20") besides WrMo *ɣu-tuɣar* "3rd", *ɣuriɣu* "three-fingers-wide" and *ɣunan* "three-year-old animal", Kalmyk *g̨urm̨sn̨* "dreifädiges Seil" < *ɣurmasun etc. (Ramstedt 1907: 8).

4 *dör-ben > WrMo, MMo *dörben*, Shira-Yogur, Shirongol-Punan *durben*, Monguor *diēran*, Dungsiang *ǯieruan*, Daghur *dureb, durben, durbun* etc., cf. *dörtin "40" > WrMo *döčin*, Shira-Yogur *dyučon*, Monguor *tieǰin* (*t-* after *tayin* "50"), besides WrMo *dö-töger* "4th", *dörigü* "four-fingers-wide", *dönen* "four-year-old animal" and probably *debger* "four-edged, quadrat" (Golstunskij) vs. *tebger* (Kowalewski) in spite of skepsis of Ramstedt (1907: 7).

5 **tawu-[γa]n* > Khitan *taw* (Starikov 1982: 148; Doerfer 1992: 49), WrMo, MMo *tabun*, Khamnigal *tabu(n)*, Shira-Yogur *tabyn*, Monguor *tāwẹ̄n*, Dungsiang *tavuan*, Shirongol-Punan *tà'ŋ* (the unique *-ŋ* and the final *-uan* in Dungsiang can reflect the expected **-u-γan* as in Dungsiang *ǯyguan* "6" < **ǯirγuγan*) etc., cf. WrMo *tabin*, Shira-Yogur *tabyn*, Khamnigal *tabi(n)*, Monguor *tayin*, Shirongol-Punan *ta ' ŋu-ran* (*-ran* is a suffix common for the tens 30–90) "50", besides WrMo *tab-taγar*, *tab-tuγar* "5th" and *tuulan* "five-year-old" < **tawlan* (Vladimircov 1929: 259).

6 **ǯirγu-γan* > WrMo *jirγuγan*, MMo *jirγo'an* ~ *jirwa'an* (Secret History), *jirqo'an* (quadrat script), *jirγu'an* (Muqaddimat), Monguor *jirgōn*, Shirongol-Punan *jirgon*, Dungsiang *ǯyguan*, Shira-Yogur *jurgon*, Khamnigal *ǰurgaa(n)* etc., cf. WrMo, Monguor *jiran*, Khamnigal *jira(n)*, Šira-Yogur *jiren* etc. "60".

7 **dol(u)-γan* > WrMo *doluγan*, MMo *dolo'an*, Monguor *dolōn*, Khamnigal *doloo(n)*, Daghur *dolō(ŋ)*, Shira-Yogur *dolon*, Shirongol-Punan *tolun* etc., cf. WrMo, Monguor *dalan*, Khamnigal *dala(n)*, Shira-Yogur *talan*, Shirongol-Wuyangpu *talyan* (cf. *nayan* "80") "70". Poppe 1955: 246 reconstructs pre-Mongolian **daluγan* with *-a-* after *dalan* "70".

8 **nayi-man* > WrMo *nayiman* (cf. Vladimircov 1929: 283; Poppe 1938: 66 quotes the form of dat.-loc. in Quadrat script *nayiman(a)*), *naị̂man* (after *nayan* "80"), MMo *naị̂man*, Khamnigal *naima(n)*, Daghur *nayma(ŋ)*, Dungsiang *niaman*, Shira-Yogur *nayman*, Shirongul- Punan *niyman*, Monguor *nẹ̄man* etc., cf. WrMo, Monguor, Shira-Yogur *nayan*, Khamnigal *naya(n)*, Daghur *naya(ŋ)* etc. "80". E. Hamp 1970: 193 reconstructs **nayN-ban*, while Janhunen 1993: 177 proposes **nai-paln*.

9 **yersün* > WrMo *yesün* (older) ~ *yisün*, MMo *yisün*, Baoan *yirsən* (Kara 1990: 334), Shira-Yogur *isun*, Daghur *yise(ŋ)*, Khamnigal *yvxv(n)*, Monguor *ṣʒẹ̄n*, Shirongol-Wuyangpu *rsyn*, Dungsiang *jesun*, Khalkha *yėsseŋ* etc., cf. WrMo *yeren*, MMo *yiren*, Monguor *yerin*, Khamnigal *yere(n)*, Shirongol-Wuyangpu *iryn*, Shira-Yogur *iren*, Daghur *yure(ŋ)* etc. "90". Krippes 1991: 148 adds Khitan *ši*, a tentative reading of the ideogram "9"; Starikov 1982: 151 quotes *is* after Chinggeltei, Doerfer 1992: 49 offers the reading *yisə*, while the modern reading of the Chinese gloss is *sin* (Starikov 1982: 118). Poppe 1955: 246 reconstructed pMo **yersün*, followed by Hamp 1970: 195 (**yir(s)-*), while Miller 1971: 237 prefers the distinction: sg. **yis-* vs. pl.-du. **yir-*. Pritsak 1954: 245 proposes that the suffixes **-sün* and **-en* indicated singular and plural respectively.

10 **[φ]ar(-)ban* > WrMo, Khamnigal *arban*, Buriat *arbaŋ*, Mogol *arbōn*, *arbā̄n*, MMo *harban*, Shira-Yogur *xarban*, Daghur *xarba(n)*, *hareben*, *χarwaŋ*, Monguor *xar(w)an*, Dungsiang *haruan* etc.

100 **ǯaγ/wun* > WrMo *jaγun*, MMo *ja'un*, *ǰa(w)un* (Istanbul voc.), Daghur *ǰau*, Monguor *ǰiōŋ*, Shira-Yogur *juun*, Khamnigal *joo(n)*, Shirongol-Wuyangpu *ǰon* etc., cf. also Khitan *ǰau*.

Comparative-etymological analysis

18. Mo **ni-ken* "1" is probably extended by the same (=diminutive) suffix as WrMo *üčüken* "little, few" or MMo *ke'üken* "child" vs. *ke'ün* "son" (Poppe 1955: 239). Analogically in some Tungus languages the numeral **ämün* "1" has been extended by the diminutive suffix **-kān / *-kə̄n*, e.g. Evenki *emūkēn* vs. *emūn* "1" etc. (Benzing 1955: 58–89; TMS II: 270). Ramstedt 1907: 4 & 1957: 65 derived **ni-* from the root attested in WrMo *neį* "together, unity" (Vladimircov 1929: 286; cf. Kalmyk *nī* "unity, agreement, harmony" — Ramstedt 1935: 277), *neyide, neyite* "together", *neyile-* "to unite, unify", *neyigen* "equal, identical", Kalmyk *nīkn̥* "equal", MMo (1389) *neyide* "ensemble, en commun" (Lewicki) etc.

Independently Ramstedt (1907: 5) noticed that formally comparable Kara-Kyrgiz *jekā* "alone, sole" and Chagatai *jāk* "one", *jākā* "alone" represent probably borrowings from Modern Persian *yak* "one" (Räsänen 1969: 195).

The closest extra-Mongolian parallel appears surprisingly in Nivkh **ńi* "1" (Panfilov 1973: 9).

19. Mo **qowï-ar* "2" is probably an innovation. Its etymology is uncertain. Ramstedt 1907: 5–6 reconstructed pMo **qoyir* on the basis *qoyirγu* "zweifelnd, unentschieden" (cf. also *qoyiγ ~ quyiγ* "peninsula" ?), seeing in the final *-r* a suffix comparable with *-r* separable in *küči* "strength" vs. *küčir* "heavy" or *möči* "limbs" vs. *möčir* "branch". The stem **qoyi-* is compared with WrMo, MMo *qoyina* "after, behind" (Poppe 1955: 79), *qoyitu* "der Hintere" (Ramstedt l.c.), starting from the opposition Tg **ämün* "1" : Mo **qoyir* "2" = Mo *emüne* "in front, before" : Mo *qoyina* "after, behind". Vladimircov's reconstruction **qowï-* is compatible with WrMo *qubi* "part", *qubiya-* "to divide", *qubil-* "to change the appearance, take another shape" (Poppe 1955: 32) // Tg **xöbü-* "part" (TMS I: 403). Miller 1996: 116 adds still NKor word *kai* used in so called 'Four-Stick' game in the meaning "2".

The only hopeful extra-Altaic parallels appear in Yukaghir **kuj-/*kij-* "2", cf. Chuvan *kuyen, kuyun* "2" & *imoxanbo kiyon* "7" (Boensing), North Yukaghir **kij-* "2" etc. (Tailleur, *UAJb* 34 [1962]: 70), and perhaps in FU **koj-m[on]Vś* "20" (UEW 224–225), where the second component associated with the meaning "10" implies the meaning "2" for the component **koj-*.

20. Mo **ǯi( )r-in* "2" and WrMo *ǰöbe-ger* "one of two" have cognates in Tg **ǯöwä(-r)* "2", MKor *tur-h* "2" (Ramstedt 1957: 65) and perhaps OJp *ture* "companion" (Martin, *Lg* 42[1966]: 245). Ramstedt (1949: 275) added Tk (Mahmud al-Kašgari) *tükä* "a calf in the second year". But there are at least comparably hopeful parallels in Teleut *tüŋ* "pair; similar", Lebedin *tügäj*, Barabin *tə̄äj* "paarig" (Räsänen 1969: 505) and perhaps also Tk **düř* > Uygur *tüz* "gleich, gleichmässig, eben, vollkommen", Turkmen *düz* "eben, glatt, ger-

ade", Chuvash *tür* "eben" etc. (Räsänen 1969: 508; Dybo 1991: 59; Mudrak 1993: 68; Starostin 1991: 13 compares Tk forms with MKor *čŕŕ-tá* "to keep straight on", reconstructing pAlt **č-*; Budagov has also recorded the meaning "even (number)", see Sevortjan II: 310), if the segmentation **dü-ř* is plausible. The quoted forms can be projected in pAlt **töwi* or **tüwi* "2; pair". The further development could have been approximately as follows: **töwi* > pre-Mo-Tg **döwi* >**diöwi* (*-ăr*) > Tg **ǯöwăr* and Mo **ǯi(w)ir-* besides **ǯöwe-* > *ǰöbe-(ger)* (see the rule 7). Starostin 1991: 33 reconstructs pAlt **diüwV* "2". Let us repeat the set of responses among dentals postulated by him (1991: 21):

	rule	pAlt >	Tk	Mo	Tg	Kor
	6.	**t'-*	**t-*	**t-*	**t-*	*t-*
		**t'i-*	**ti-*	**či-*	**čį-*	
	7.	**t-*	**d-*	**d-*	**d-*	*t-*
		**ti-*	**di-*	**či-*	**ǯį-*	
	8.	**d-*	**j-*	**d-*	**d-*	*t-*
		**di-*	**ji-*	**ǯi-*	**ǯį-*	
cf.	also 18.	**č-*	**d-*	**d-*	**ǯ-*	*č-*
		**či-*	**di-*	**ǯi-*	**ǯį-*	

Mo &Tg **ǯ-* and Kor *t-* imply Tk **j-* (= **ǯ-* according to Mudrak; series 8). The only candidate could be the Tk numeral "7", traditionally reconstructed **jätti*, accepting the semantic motivation "the second (after five)" (see Hamp's analysis of Tk "70"). Tk **d-*, Tg **ǯ-* and Kor *t-* imply Mo **či-* according to Starostin, but there is Mo **ǯirin* "2" (but the parallel series 18 also implies Mo **ǯi-* in the series 7). The main argument for the palatalized series (7) is based on the problematic etymon "stone": Tk **dłtāĺ* = **tiāł* (Mudrak) = **tįalįa* (Doerfer) // Mo **čilaγun* // Tg **ǯola* // MKor **tōrh* (Starostin 1991: 119). The external parallels (Kartvelian **ţal-* "flintstone" — see Illič-Svityč, Étimologija 1965: 343) confirm the originality of pAlt **t'-* > Mo **t-/*či-*, but not Tg **d-/*ǯį-*. The Mo > Tg borrowing proposed by Poppe (1960: 77) looks as a plausible explanation. An alternative possibility is represented by the solution separating Tg **ǯola* "stone" (& **ǯal-*, TMS I: 247) from the other Altaic denotations of "stone", and by finding a hopeful cognate in Tk: Turkish (dial.), Koibalsan *jalym* "rock", Turkish (dial.) *yalın* "stone, high rock; bare", Osman *jalman* "the summit of the mountain resembling an edge" (Sevortjan IV: 103), indicating an original pAlt **ǯ-*. On the other hand, the external cognate for the numeral "2" reflected in IE **dwo-H$_1$* (Illič-Svityč l.c. 338, accepted even by Starostin 1991: 33) implies pAlt **t-* and not **d-*, reconstructed by Starostin. On the basis of these arguments the palatalized series 7 should have been modified as follows:

Alt **ti-* > Tk **di-* // Mo **ǯi-* // Tg **ǯį-*.

21. Mo **γur-ban* "3" and **γuriγu* (> Kalmyk *gurü* "drei Finger breit" — Ramstedt 1935: 155) with a further suffixal extension can perhaps be derived from WrMo *γaur, γur* "Handwurzel, Handgelenk, Unterarm" (Ramstedt 1935: 157), although the semantic motivation remains puzzling (three joints of the arm: wrist, elbow, shoulder ?). There are only hypothetical traces of external cognates, but their interpretation is not unambiguous. Miller 1971: 236–237 sees in OJp *kökönö* "9" a multiplication "3x3", isolating here the root **kö* "3", cf. Mo **ǯir-γu--γan* "6" = "2x3". He also adds Kor *ilkop* "7", analyzing it as *yər* "10" — **γu* "3" — *əp(s)* "be nonexistent", i.e. "7" = "10–3" (1971: 244). Later he finds a more convincing correspondent of Mo *γur(-ban)* "3" in NKor *kŏl* meaning "3" in so called 'Four-stick' game (1996: 116).

There are also promising external cognates: Fenno-Ugric **kurmi* "3" (UEW 174; Sammallahti 1988: 543), continuing in Hungarian *három*, pMansi **kuurem*, while **-l-* in Fenno-Permian **kolmi* and pKhanty **käälem* is explainable by the influence of the following numeral **ńeljä* "4" (Collinder 1965: 145). The bare root **kur-* is probably extended by the **-m*-suffix of abstract nouns, i.e. **kurmi* = "Dreiheit". The old comparison of the FU "3" with Samoyed **näkur* "3" (Helimski, *JSFOu* 81[1987]: 77; Janhunen 1977: 99 reconstructs **näkôjr*) proposed by Castrén 1854: 194 is in principle also possible. The segmentation **nä-kur* allows to connect both FU **kur-* and Samoyed **-kur*. The component **nä-* can be identified with the element **nä-* forming some postpositions, e.g. **näŋ* "zu" (dat. sg.), **nänå* "bei" (loc. sg.), **nätô* "von" (abl. sg.), **nän-mônå* (pros. sg.) (Janhunen 1977: 99).

Bouda 1952: 25–26 compared FU "3" with Chukchi-Koryak **kurym* > Chukchi *krym-qor*, Koryak *kyjym-qoj* "dreijähriges weibliches Rentier", cf. *qora & qoja* "Rentier" (cf. Mo *γunan* "three years old").

It remains to explain the final component *-ban*. The suggestive parallel *-ben* in Mo *dör-ben* indicates their common origin. Hamp 1970: 194 tries to identify the doublet *-ban/-ben* with the reflexive-possessive suffix attested in WrMo *-ban/-ben* (after final vowels) and *-iyan/-iyen* (after final consonants) (Poppe 1955: 233). Etymologically, the Mo reflexive suffix is related to Tg **mēn* "(one)self", MKor *mŏm* "body; person; self" and perhaps OJp *mono* "thing, method, being" (Ramstedt 1949: 151; Poppe 1955: 231; TMS I: 568; Starostin 1991: 280 reconstructs pAlt **māni*). Blažek, *ArOr* 58[1990]: 209 proposed a connection with the Nostratic denotation of "man, human being" attested in AA **manilu* /// IE **manu-/*monu-* /// FU **mäńće* /// Dravidian **maɳ* (Illič-Svityč 1976: n. 292). Concerning the semantic development, cf. French *on* < *homme* or Tg **beje* "man; body" > "oneself" (TMS I: 122–123). But the distributive differentiation depending on the termination in vowel or consonant is just opposite than in the case of the analyzed numerals. Ramstedt 1907: 8 reconstructed pMo **γur-man* "3" *&*dör-men* "4" besides the attested *nayiman* "8". Later he connected this suffix with Kor *măn* "hand", *mandi-* "fingern, mit Händen betasten" (1982: 106). Perhaps a more hopeful candidate could be Kor *mān* "size, amount, number", compared by Ramstedt 1982: 105

with the NTg suffix **-mān* forming multiplicative numerals (Benzing 1955: 106). Finally there are also promising properly Mongolian examples, which could form the suffix **-man & *-men*, namely Dungsiang *man* "all" (Todaeva 1961: 128), Daghur *mani* "group" (Martin 1966: 249). The hypothetical collective function of the suffix has an analogy in OJp numerative *-tu*, which is compared with Nanai *-tol-tu*: *ilan-to* "all 3", *duyin-tu* "all 4" etc. (Avrorin 1959: 237; Menges 1975: 92).

22. Mo **dör-ben* "4" is extended by the same suffix as the numeral "3". The root **dör-*, attested also in **dörtïn* "40", has cognates in Tk **dȫrt* (Dybo) // Tg **dujgin* // pJp **də-* "4", see Tk "4" discussed above. Miller 1996: 116 adds early MKor *towi* recorded in Japanese syllabic script (see # 46). Kalmyk *dörǖ* "vier Finger breit; четверть", reflecting **dörigü* (similarly *gurǖ* "drei Finger breit" < **γuriγu* — see Ramstedt 1907: 7 and 1935: 99, 155), is terminated by a suffix comparable with OTk *törtägü* "four together" (Clauson 1959: 29; Kononov 1980: 114). If we accept this identification including the function of the suffixal extension, it is possible to connect the root **dör-* with Kalmyk *dörö* "Treppe, Erhöhung" < **döre* and Evenki *dörā̄* "Hügel" (missing in TMS; quoted after Ramstedt 1935: 99). The primary meaning could be extrapoled *"knuckles [of a hand] together" > "four". This conclusion agrees very well with Turkic data, where Chuvash *türt* "Rücken" in the idiom *ală türt-ĕšĕ* "Handrücken" (Egorov 1964: 266; Doerfer, *OLZ* 66[1971]: 338) suggests a very similar primary semantic motivation.

23. Mo **tawu-*[*γa*]*n* "5" has been compared with various Altaic etymons:

(a) Tg **[i]tuŋga* "5" // MKor *tàsăs* // Koguryŏ *utu* // pJp **ɨtù-* "5", cf. also Old Bolgarian **etə* "5" (Mudrak) and the puzzling Chagatai *ittik* "50" discussed above (Tk "50") — see Starostin 1991: 70, reconstructing pAlt **t'a(u)* while Vovin 1994: 106 proposes pAlt **it^{h}V*.

(b) Jp *taba* "handful, bunch" (Miller 1971: 233). Ramstedt 1907: 12 connected the Mo numeral "5" with WrMo *tabaγ* "sole (of the foot)" // Tk **tāpan* id. (cf. Räsänen 1969: 462; Starostin 1991: 118f reconstructs Tk **d-* and assumes Mo *tabaγ* < Tk dim. **dāpan-ak*) and also Teleut *tabaš*, Barabin Tatar *tabac* "Handfläche, hohle Hand".

(c) WrMo *taba* "sufficiency" (Hamp 1970: 193).

(d) OJp *töwo* "10" (Ozawa, cf. Miller 1971: 233).

There is again a very suggestive parallel in Nivkh *t'o* "5" (Panfilov 1973: 9).

24. Mo **ǯirγu-γan* "6" has a transparent internal structure recognized already by Schott 1853: 11, cf. also Ramstedt 1907: 13–14 and Miller 1971: 221, 237, 240, namely **ǯir-* & **γu*[*r-*] "2 x 3". The comparison of Mo "6" with Tg **ńiŋgun* "6" (Poppe) (see Ramstedt l.c., Poppe 1960: 28, 88, 130 and Miller 1971: 240) must be rejected. The correspondence Mo **ǯi-*// Tg **ńi-*, based esp. on the comparison of WrMo *ǯiru-* "to draw" // Tg **ńiru-* "id., to

paint" (Poppe 1960: 28), is not valid. Starostin 1991: 117f, fn. 7 has separated two different roots here:

(1) Tk **dɨr-ŋa-* "to scratch" // Mo *ǯiru-* "to draw" // Tg *ǯur(ū)-* "to scratch";

(2) Tk **jař-* "to write" // Tg **ńiru-* "to draw, paint" // MKor *niru-, nir-k-* "to read".

25. Mo **dol(u)-γan* "7" has no unambiguos etymology. Janhunen 1993: 181 thinks that the presence of **-u-* before suffix might well be due to the rhythmic analogy of the numeral "6". There are no traces of this vowel in Jurchen *dalhûn* "17" (Janhunen l.c.). Ramstedt 1907: 14 connected the numeral with WrMo *doluγaburi* (*doluγubur* by Golstunskij) "forefinger", Khalkha *Dolōwɐr* id. and the Mongolian borrowing in Koibalsan *tolamer* "ring-finger" (< **dolāwur*), identifying here the deverbal suffix *-buri*, extending the verb *doluγa-* "to lick". He saw an analagy in Tk "7", deriving it from the verb "to eat" (see above). The semantic motivation "forefinger" = *"lickfinger" or *"eatfinger" is really known, cf. Greek λιχανός, Lithuanian *ližius* or Shilha of Tazerwalt *mãllaγ*, all "fore-finger" = lit. "lick-finger" — see Blažek, *ArOr* 66[1998]: 156.

An alternative solution can be a derivation from pAlt **čōlu* "full" > Tk **dōlɨ* "full" : **dōl-* "to fill" // Tg **ǯalu-(m)* : **ǯalu-(p-)* id. // MKor *čăra-* "to be full, sufficient" // OJp *tar-* id. (Starostin 1991: 45, 129, fn. 89; Martin 1966: 243). The expected cognate in Mongolian would look ***dolu-* or ***dalu-* (cf. the response 18). This point of view agrees with Hartman (*KSz* 1[1900]: 155) who proposed that a parallel development can be assumed for Tk **jet-di* "7" (Hartman), deriving it from **jet-* "erreichen, genug sein", cf. e.g. Turkish dial. *yetiz* "all, whole, full" (Räsänen 1969: 199; Sevortjan IV: 193–194).

26. Mo **nay(i)-man* "8" represents a serious puzzle among Mongolian numerals. Ramstedt (1907: 17–18) is probably right, identifying the suffix **-man* with the termination **-ban/*-ben* of the numerals "3", "4". The evident external cognates appear only in Manchu *niomere* "octopus", Udihe *ńumie* id. (TMS I: 645), which could, however, have been borrowed from some Mongolian source (Janhunen 1993: 178 quotes as a semantic parallel WrMo *naimalǰin* "[eight-legged] crab").

Perhaps the identification of the root **nayi-* or **naį-* with MMo (1389) *naį* "au plus haut degré, très" (Lewicki 1959: 62) = (Secret History) elative adverb *nai* "sehr" (Haenisch 1939: 113) represents the most simply solution.

Hamp's reconstruction **nayN-ban* opens a possibility to connect the root **nayN-* with Tg **ńān* "again, once more" (TMS I: 633), Tk **janal/*jene* "again", usually derived from **jan-* "to turn back" (Sevortjan IV: 115), and perhaps with Kor *nai-nai* "again and again" (Ramstedt 1949: 159). Hence "8" = "once more [four]"?

A hypothetical relationship of Mo **nay(i)-man* "8" with MKor *nəy-h* "4" implies an original meaning "4 x 2" for the Mongolian numeral. There are at least two possibilities: (1) The protoform is **nayi*, with a regular plural **nayin* (Poppe 1955: 175), extended **nayin* + *-man* > **nayiman* . (2) The protoform is **nayil*, with a regular plural **nayid* (Poppe 1955: 179), extended **nayid* + *-man* > **nayiman*. Esp. this second alternative opens a possibility to deduce pAlt **ńVl-* *"4", directly attested in Korean (# 46), indirectly in Mongolian "8" = "4 x 2" and Tungus "6" = "4 [subtracted from 10]" (# 35).

There are also extra-Altaic parallels: besides Nivkh *nu-*, *ny-* "4" & *minr* "8" esp. FU **ńeljä* "4" & Ugric **ńalV* "8" (UEW 315–316; 875) and Dravidian **nāl* "4". Miller (1971: 233) sees in the Mo "8" an isolated innovation. Later he proposes a Tungus origin, reconstructing the following development: **ǯär-män* "2 [subtracted from] 10" > **när-män* > **najman* (Miller 1975: 148). Although this artificial construct has no support in any Tungus language, the idea of a foreign origin can be fruitful. There is Nivkh *minr* "8" with a transparent internal structure, cf. *mV-* "2" and *nu(r)* "4", but the comparison with Mongolian "8" would presuppose a metathesis ***nVmr* (cf. Manchu *niomere* "octopus" ?!) and a following substitution of the final **-r* > **-n*. On the other hand, Nivkh (Amur) *ńyńben* "9" (= *"one subtracted from [ten]"; cf. *ńV-* "1") resembles Mongolian "8" much more suggestively. The semantic difference remains unexplained. Perhaps, accepting the original semantics for "9" = "the greatest [number]" (see below), it is plausible to reconstruct the primary meaning *"one subtracted from the **unit**".

27. Mo **yersün* "9" can be segmented **yer-sün* or **yers-ün*. The first possibility offers to identify the second part with the nominal suffix **-sun/*-sün*. In the second case the final *-ün* resembles the genitive ending. The first part **yers-* is terminated in *-s-*, which could reflect the negative verb **ese*. If we accept the connection of the root **yer-* with WrMo *yerü* "the most of", *yerüdügen* "for the greatest part, generally", *yerüŋkei* "common", the original meaning could be "the greatest [number]". Ramstedt 1907: 18 confirms that the number "9" is understood as a special unit among Mongols. The alternative segmentation **yer-s-* can be interpreted as "the great number without [one]". It was already Gombocz (*KSz* 13[1913]: 11–12) who compared Mo "9"/"90" with Tk **jüǖ* "100", perhaps reduced from **jüǖ-ōn* "the biggest ten" (cf. Ramstedt 1907: 19). The other cognates are MKor *jərəh* "a big quantity, number", *jər* "10" (Starostin) = *'yərh* (Lee) and OJp *jòrò-du* "10.000" (Ramstedt 1982: 62; Syromjatnikov 1981: 73; Starostin, Dybo & Mudrak 1995, n. 265).

28. Mo **ɸarban* "10" has no convincing etymology. Ramstedt's attempt to connect it with WrMo *arba-* "sich spritzen", Kalmyk *arwā-* "sich aufrecht stellen, sich in allen Richtungen strecken (Finger, Zweige), sich sträuben (Haar, Blätter)" (1907: 21) is doubtful semantically and also phonetically. Poppe (1960: 87) compares Mo *arba-* with Manchu *arbun* "Gebärde" and

Evenki *arpul-* "winken", excluding so the original pMo **φ-* ~ Manchu *f-* & Evenki *h-*. Ramstedt (1907: 9) also quoted Moghol *arbōn* "10; mehrere, viele; einige" but it represents more probably a contamination of the numeral "10" and Wr & MMo *arbin* "reichlich" without any traces of *h-* in MMo or Evenki (cf. *albigū-* "vergrössern", see Poppe 1960: 87). Phonetically a more plausible correspondent could be MMo (Secret History) *har*, WrMo *ar* "muster, ornament, figures" (Ramstedt 1949: 185); cf. also Tg **oṅō* "picture, ornament" (TMS II: 20) vs. Tk **ōn* "10" (# 10).

29. Mo **ǯaγ/wun* "100" has the most convincing cognate in Tg **ǯuwan* "10" (Ramstedt 1907: 22; Id. 1957: 67). Concerning the correspondence in vocalism, cf. e.g. Mo **daγu-s/l-* "to finish" vs. Tg **duwē* "end" (TMS I: 218). Ramstedt 1949: 77 connects the Tg form with Manchu *ǯuwan-* "to open the mouth, come loose", supposing an original meaning *"open [hand]". But the original meaning of this Tg verb was "to yawn" (TMS I: 281). The other etymological attempts are also problematic: Kor *čjuŋ* "all (of number)" (Ramstedt 1982: 42 compared it with WrMo *čöm* "all") or Kor *čoi* "all, altogether, entirely" (Ramstedt 1982: 38 compared it with Oroch *čupali* and Mo *čo(γu)* "all").

Tungus numerals

Probably the only systematic reconstruction of the Tungus numerals was presented by J. Benzing (1955: 26, 101–103), including a tentative projection on a more archaic level. Let us compare them with the alternative reconstructions of Starostin (1991: 213, 33, 141):

	Benzing		(North)		(South)	Starostin	
1	**ămŭn*	< ***ăm-gŭăn*				1	**emū-n*
2	**ǯŏr/*ǯŭăr*	< ***ǯi-gŭă-r*	20	**ǯör-ǯ[uw]an/r, -miar*	**xorin* < Mong	2	**ǯuwe-r*
3	**īlan*	< ***īl-guan* ?	30	**īlan-ǯ[uw]an/r, -miar* etc.	**gutĭn* < Mong	3	
4	**dŭgŭn*	< ***dŭr-gŭăn*	40		**dă[s]in* < Mong	4	**dŭ-gĭn*
5	**tuŕga*		50		**susai*	5	**tu-ŕga*
6	**ńŏŋŭn*	< ***ńŏŋ-gŭăn*	60		**ńŏŋŭn/r-ǯu(a)*	6	**ńu-ŋu-n*
7	**nadan*	< ***nad-guan* ?			etc.	7	**nada-n*
8	**ǯapkun*	< ***ǯap-kuan*				8	**ǯa-pku-n*
9	**xŭyăgŭn*	< ***xŭyă-gŭăn*				9	**xegŭ-n*
10	**ǯuwan*		100	**ńamă*	**taŋgū*	10	**ǯuwa-n*
	Even **mĭan*						

There are remarkable facts of the oldest records leading to important corrections of some archetypes. The oldest written Tungus language is Jurchen (12th-16th cent.). The Jurchen numerals are transcribed in various ways (Janhunen 1993, Mudrak 1985, Miller 1975, Menges 1968a):

	Jurchen		Manchu		Jurchen				Manchu
	Mudrak	Menges			Janhunen	Mudrak	Miller	Menges	
1	*emu*	*'o-mu*	*emu*	11	*omšo[n]*	*omslo*	*omšo*	*'an-šo*	*omšon* "11th month"
2	*ǯuwe*	*ǯo*	*ǯuwe*	12	*jirhûn > ǰirhûn*	*ǰirxwan*	*ǰir-xuan*	*ǰi-r/l-ḫuan*	*ǯorxon* "12th month"
3	*(j)ilan*	*i-lan*	*ilan*	13	*gôrhûn*	*gorxwan*	*ɣuor-xuan*	*ǧuo-r/l-ḫuan*	
4	*dujin*	*ǧu-jin*	*dujn*	14	*durhun*	*durxwan*	*dur-xuan*	*ǧu-r/l-ḫuan*	
5	*čunǯa*	*šun-ǯa*	*sunǯa*	15	*tofûhûn*	*tobuxwan*	*to-bu-xuan*	*to-ḫu-ḫuan*	*tofoxon* "15; 15th day of month"
6	*niuŋǯu*	*niŋ-ǯu*	*niŋgun*	16	*nilhun*	*ni[ŋ]un*	*nül-xon > ni-xun*	*ni-ḫun*	*niolxun* "16th day of the 1st month"
7	*nadan*	*na-ǧan*	*nadan*	17	*dalhûn*	*daRxwan*	*dar-xuan*	*ǧa-r/l-ḫuan*	
8	*ǯa(h)kun*	*ǯa-kun*	*ǯa-kū*	18	*niohun*	*niuxun*	*ǰü-xun*	*njü-ḫun*	
9	*hujehun*	*wu-je-wèn*	*ujun*	19	*oniohûn*	*oniuxwan*	*oǰü-xuan*	*wo-njü-ḫuan*	
10	*ǯuwa*	*ǯua*	*ǯuwan*						

The tens are in a full agrement with the South Tungus pattern reconstructed above:

20	*horin*	*wo-lin*	*orin*	50		*susaj*		*su-sə-ji*	*susaj*
30	*gučin*	*ǧu-šen*	*gusin*	60		*ni(u)ŋǯu*		*niŋ-ǯu*	*ninǯu*
40	*dexi*	*te-ḫi*	*dexi*	70		*nadanǯu*		*na-ǧan-ǯu*	*nadanǯu*
				80		*ǯa(h)kunǯu*		*ǯa-kun-ǯu*	*ǯakūnǯu*
				90		*hujehunǯu*		*wu-je-wan-ǯu*	*ujunǯu*
				100		*tangu*		*taŋ-ǧu*	*taŋgū*

During the 18th and early 19th cent., the first records of non-literary Tungus languages appear:

	Lamut = Even						Oxotsk		Aldan	Kamchatka Bay
	Witsen 1705						Pallas 1787	Billings / Saryov 1811	Erman 1848	Messerschmidt / Strahlenberg 1730
1	*omun*	11	*omun-ǯian*			1	*umín*	*omun*	*omun*	*omokon*
2	*ǯur*	12	*ǯur-ǯian*	20	*dianǯialakan*	2	*ǰur*	*dǰur*	*diur*	*d'giur / dgiur*
3	*ilan*	13	*ilan-ǯian*	30	*mugina-ǯian !*	3	*ilan*	*ilelan*	*ellən*	*üttan / ullan*
4	*dagan*	14	*digin-ǯian*	40	*digin-ǯanǯialakan*	4	*dǰgin*	*dixin*	*digun*	*daegen / degen*
5	*toŋan*	15	*ǯiakon-ǯian*	50	*toŋan-ǯanǯialakan*	5	*toŋán*	*tuŋan*	*tuŋan*	*gedin*
6	*nuigun*	16	*nun-ǯian*	60	*nugun-ǯianǯialakan*	6	*nyuŋun*	*yuŋen*	*niuŋan*	*d'galkun/dagalkun*
7	*nadan*	17	*nodan-ǯian*	70	*nadan-ǯianǯialakan*	7	*nadán*	*nadan*	*nadan*	*nadan*
8	*ǯiabkan*	18	*ǯiabkon-ǯian*	80	*ǯabkan-ǯanǯialakan*	8	*dlapkun*	*digkabkan*	*tiupan*	
9	*yigin*	19	*yigin-ǯian*	90	*yugnan-ǯanǯialakan*	9	*uyun*	*užul*	*uyun*	
10	*ǯian*					10	*mĕr*	*mian*	*men*	*/ diaar*

	Tongusu-Konni	Evenki Barguzin	Oleni	Yenisejsk	Lower Tunguska	Chapogir	Upper Angara
	Strahlenberg	Pallas #146	Strahlenberg	AP	AP	Pallas #151	Pallas #147
1	*amka*	*umukón*	*umun*	*ummukon*	*múkonn*	*omukon*	*umukón*
2	*czivo*	*ǰyur*	*dziun*	*ǯjur*	*djuhr*	*ǰur*	*ǰur*
3	*jelan*	*ilán*	*ilen*	*illün*	*ilán*	*ilān*	*ilyan*
4	*tuin*	*ďygĭn*	*digin*	*dĭggin*	*dégenn*	*dĭgín*	*digín*
5	*guincza* sic!	*toŋá*	*tunya*	*túŋja*	*tóŋa*	*tuŋa*	*tuŋá*
6	*niumu*	*nyugún*	*nucun*	*njúŋun*	*núŋun*	*nugun*	*nyûgun*

	Tongusu-Konni	Evenki Barguzin	Oleni	Yenisejsk	Lower Tunguska	Chapogir	Upper Angara
	Strahlenberg	Pallas #146	Strahlenberg	AP	AP	Pallas #151	Pallas #147
7	*nadan*	*nádan*	*nadun*	*nádan*	*naddan*	*nadán*	*nadan*
8	*czachun*	*ʃapkún*	*ziapkun* "9" !	*djápkun*	*djápkull*	*ʃamkun*	*ʃapkún*
9	*unjun*	*yögin*	*giggin* "8" !	*jégin*	*ijógjin*	*yegin*	*tuggín*
10	*czuen*	*ʃaán*	*ziun*	*ʒjan*	*djánn*	*ʃan*	*ʃan*
20	*oren*	*orin*		*ʒjur-ʒjar*	*djuhr-jarr*		
30	*ceuzin*	*elan-ʃár*		*illán-ʒjar*	*ilann-jarr*		
40	*tanhi*	*dygin-ʃár*		*diggin-ʒjar*	*dégenn-jarr*		
50	*zuzei*	*toŋa-ʃár*					
60	*niumhu*	*nyugun-ʃár*					
70	*nadanzu*	*nadan-ʃár*					
80	*czanchunzu*	*ʃapkun-ʃár*					
90	*kunjuntzu*	*yögin-ʃár*					
100	*tengun*	*njamáʃin*			*nemádje*		*nyama*

These forms lead to the modification of Benzing's reconstructions:

1 **ämün*
2 **ʒöwär*
3 **īl(V)lan ?*
4 **duj-gin*
5 **tu[a]ńŋa*
6 **ńölgün*
7 **nadan*
8 **ʒab-kun*
9 **xüńä-gin*
10 **ʒuwan & *mïan*
100 **taŋū & *ńamä(-ʒin)*

Comparative-etymological analysis

30. Tg **ämün* (Benzing) = **emū-n* (Starostin) = **emö-n* (Janhunen) "1" has been compared with WrMo *ebür* "Vorderseite, Süd, Südseite des Berges, Brust, Schoss", dat. *emüne* "vornen", Kalmyk *ömnő* "vorn, voran, nach Süden" (the alternation of *-r-/-n-* suffixes also apears in other words, e.g. *dotur* "Innenseite" vs. *dotuna* "innen" or *γadar* "Aussenseite" vs. *γadana* "aussen"), cf. also WrMo *ebüče-* "vereinigen" (Ramstedt 1907: 5). Ramstedt 1949: 54 compared Manchu and Nanai *emuči* "the first" with Kor *ẹmʒi*, isolated from *ẹmʒi — sonkkărăk* "thumb" (*sonkkărăk* "finger"). Miller 1971: 230 and Murayama 1958: 229 and 1966: 154 add Jp *omo* "paramount" < OJp *ömö* "Gesicht, Vorderseite, Hauptsache". Jurchen **omšo[n]* "11" and Manchu

omšon "11th month" are more probably borrowed from Mo *onča* "special, separate, unique", rather than inherited from Tg **ämün* "1" (Janhunen 1993: 172). The same origin is also evident for Solon *úíš'un bé*, *umšóń bé* "11th moon" (TMS II: 272) in contrary to Miller 1975: 151, who sees here the traces of Manchu "9".

31. Tg **ǯöwä-(r)* "2", originally perhaps **ǯöwi* "2" and **ǯöwi-är* > **ǯöwär* "pair", corresponds to Mo **ǯirin* "2" (about women), WrMo *jöbe-ger* "one of two" and accepting the secondary palatalization (see Mo "2") also to MKor *tūr-h*, OKor **tubɨr* ~ **tuwɨr* "2" (Starostin 1991: 33), OJp *ture* "companion", Tk **düř* "equal", **[d]üŋ* "pair. Cf. further Even *dúdgun* "pair, couple", Udihe *dogdi* "husband; wife" (TMS I: 219). Janhunen 1993: 173 thinks that Jurchen **ǯirhûn* "12" represents rather a Mongolian import than a continuant of Tg "2". But the reading **ǰuwerhon* of Kane (1989, quoted after Janhunen) based on the Awanokuni manuscript is closer to the proto-Tungus archetype than to any Mongolian source.

Bouda, *UAJb* 25[1953]: 165 compares Tg "2" with Tamil *cōḍu* "pair", isolated within Dravidian (cf. Menges 1977: 140). This comparison implies an originality of **ǯ-* or **č-* in the form preceding the numeral "2" in Tungus and Mongolian on the Altaic level. On the other hand, in that case the relationship of MKor *turh* "2" should be excluded.

32. Tg **ïlan* "3" reconstructed by Benzing cannot be the archetype for some deviated forms: "Tongusu-Konni" *yelan*, Lamut (= Even) of Aldan *ilelan* (Billings), *ellan* (Erman), Lamut of Kamchatka Bay *ullan* (Strahlenberg), *üttan* ! (Messerschmidt). There are more hypothetical possibilities:

**ili-lan*, perhaps derived from Tg **ili-* "to stand" (TMS I:), if "3" was named after the "middle finger" = "standing out finger"; Ramstedt 1949: 167 derived it from the verb appearing in Oroch *il(i)ča-* "to bind a rope from three fibres", but Orok & Nanai *sɨlɨ-*, Olcha *sɨlü-* "to braid hair" signalize pTg **xili-* (Benzing 1955: 41; TMS I: 311);

**ul[i]-lan*, perhaps comparable with Tk **ül-* "to divide, distribute" (Räsänen 1969: 520). Sevortjan I: 628–629 connects it with Tg **il-* "to measure" (TMS I: 309);

**utlč(V)-lan*, the least probable protoform, comparable perhaps with Tk **ūč*;

**[ń]ïla-n* — the reconstruction proposed by Vovin (1993: 256) to compare it with MKor *sey(h)* & **-ńe[ ]i* "3"; cf. also MKor *nirkup* "7", interpreted as "3 bent [fingers]" (Ramstedt 1949: 77, 167).

For some starting points even extra-Altaic (substratal ?) parallels can be quoted:

**yil[e-l]an* (cf. yet Sibo *jilači* ~ *ǯilači* "third" and the record *gilaŋ* from Amur attested by Gerstfeldt with *g-* = *y-* ? — see Schmidt 1933: 366) can be compared with Yukaghir (Tundra) *jalo-*, (Kolyma) *jalo-* "3" (predicative) (Ramstedt 1907: 9; Krejnovič 1982: 119);

**illa-* resembles Eskimo (Mackenzie R.) *illa·k* "the third" (Thalbitzer, *JSFOu* 25/2[1908]: 22–23).

Jurchen *gorxwan* (Mudrak) = *gûrhûn* (Janhunen) "13" is undoubtedly of Mongolian origin (Janhunen 1993: 173–174; only Miller 1975: 146 speculated about Altaic heritage).

Lamut (= Even) *mugina-ʒian* "30" (*ʒian* = "10") recorded by Witsen (1705) is absolutely unique within Tungus. Separating the formant *-gin(a)*, formally comparable with the termination of *yigin* "9", *digin-ʒian* "19" etc., the root **mu-* can be connected with the meaning "3". There is no hopeful inner-Tungus etymology (perhaps Olcha *mejen* "a space between two objects", Evenki *muje* "edge" etc. — see TMS I: 551). On the other hand, the most attractive cognates appear in OJp *mi-* "3" = *myi-* (Martin), Koguryŏ **mit* (Miller).

33. Tg **dujgin* (Dybo) = **dügin* (Starostin, Janhunen) = **dügün* (Benzing) "4" has cognates in all Altaic branches with the exception of Korean: Tk **dȫrt* // Mo **dörben* "4", **dörigü* "vier Finger breit", **dörtïn* "40" // pJp **də-* "4". The loss of the expected *-r-* in Tg is probably regular in certain positions (Starostin 1991: 20–21, 91). The suffix **-gin* resembles the same suffix forming feminine nouns in Evenki (Benzing 1955: 76).

Manchu *durbe* "a dog with four eyes" and *durbeǯen* "tetragon" are borrowed from Mongolian (Ramstedt 1907: 7–8).

Jurchen *durhun* (Janhunen) = *durxwan* (Mudrak) "14" is also borrowed from some Mongolian source (Janhunen 1993: 174 in contrary to Miller 1975: 146, assuming a common Altaic heritage).

34. Tg **tuńga* (Benzing, Starostin) = **tuńŋa* (Janhunen) = **[i]tuńga* (Vovin) has usually been compared with Mo **tawu-[γa]n*, MKor *tasăs*, Koguryŏ *utu* and OJp *itu-* "5", cf. also Old Bolgarian **etə* "5" and puzzling Chagatai *ittik* "50" (see above Tk "50"). The reconstruction of Vovin (1994: 106 and *JSFOu* 85[1994]: 253) explains the initial **c-* > *s-* in South Tungus languages as follows: **ituńga* > **t̠uńga* > South Tungus **cuńǯa* . This rather artificial reconstruction has the most important support (and maybe the main motivation) in OJp *itu-*, but there is even a hypothetical extra-Altaic parallel in Eskimo *itu-mak* "the palm of the hand" (Thalbitzer, *JSFOu* 25/2[1908]: 23). Benzing 1955: 31 proposes an alternative reconstruction **tungia* (cf. Evenki of Yenisejsk *túŋya*) > *tunǯa* (Olcha) > *sunǯa* (Manchu) with the same distant palatal assimilation as in Tg **tārgān* > Manchu *seǯen* (Tg **-rg-* > Manchu *-ǯ-* regularly). Poppe 1960: 73 compares Tg "5" (**tuŋā* in his reconstruction) with WrMo *toγa*, MMo (Secret History) *to'a*, (Muqaddimat) *to'an*, *tōn*, Mogol *toa*, Dagur, Khalkha, Kalmyk *tō* "number" (Vladimircov 1929: 195, 214; Poppe 1955: 70).

This etymology can be significantly supplemented by Tg **tawun-* "to read; count", continuing also in Oroch *taun* "every, all", Udihe *tau(n-)*, Nanai

tao(n-) "every, all; number" (TMS II: 161–162). Adding Tg **ńiŋi* "finger" (Oroch *ńiŋi* id., Udihe *ń/niŋi* "a breadth of the joint of a finger", see TMS I: 639), the compound **tawu(n)-* & **ńiŋ-* or **tuwa(n)-* & **ńiŋ-* "all fingers" or "a number of fingers", gives finally **tu(a)ńŋa(n)* "5" (the traces of the diphthong **-ua-* appear in Solon *tuaŋán, tuaŋēn* according to Ivanovskij — see TMS II: 214). Perhaps a similar structure can be identified in MKor *tasăs* "5", analyzed by Ramstedt 1949: 77, 258–259 as a compound of Kor *tā* "all, every one" and *son* "hand".

Ramstedt (1949: 284; 1952: 65) proposed an alternative and very improbable solution, assuming a borrowing of Tg "5" from Sino-Korean *thoŋ* "all, the whole, collectivelly; a collection of five houses in census records". His comparison of Manchu *sunǯa* "5" and Evenki *solto* "fist" (Ramstedt 1949: 241) must be rejected.

On the other hand, a similarity of South Tungus **susai* "50" and MKor *suyn* id. is very suggesting.

"Tongusu-Konni" *guincza* "5" (Strahlenberg) probably represents a wrong record of South Tungus **cunǯa*.

Lamut (= Even) of Kamchatka Bay *gedin* "5" is quite unique without any parallels within Tungus (Tg **geren* "all, many"? — see TMS I: 182), Altaic or non-Altaic neighboring language families. Let us mention that Strahlenberg was mistaken in determination of concrete values of numerals (only *omokon* means really "1").

Lamut (= Even) *ǯiakon-ǯian* "15" after Witsen (1705) is also quite incomprehensible.

Jurchen *tobuxwan* (Mudrak) = *tofūhûn* (Janhunen) "15", Manchu *tofoxon* "15; 15th day in a month", Nanai *tookon*, (Sungari) *tovokon* "15" (Schmidt 1933: 366; Benzing 1955: 101) are undoubtedly borrowed from some Mongolian source (see a more detailed discussion in Janhunen 1993: 174–175, 180).

35. There are various reconstructions of Tg "6": **ńöŋün* (Benzing) = **ńöngön* (Janhunen) = **ńuŋun* (Starostin, Vovin) = **ńiŋgun* (Poppe 1960: 130; he derived it from older **nirgun* to compare it with Mo *ǯiryuγan* — more in # 24). Just Poppe's reconstruction allows to see here a derivative of Tg **ńiŋ i* "finger" (TMS I: 639; cf. also Tg "5"). Identifying in the final **-gun* the suffix attested e.g. in Evenki *bi-kūn* "I great" (Sunik 1982: 106), the numeral can be analyzed **ńiŋgun* "6" < **ńiŋ-kūn* *"[one] finger more" (Benzing 1955: 91 reconstructs **-kō̄n*). Schmidt 1933: 367 derived Manchu *niŋgun* "6" (it implies that Poppe's reconstruction is the most preferable) from Manchu *niŋgu* "oberhalb" (TMS I: 598 "top, peak; zenith"), i.e. "6" = *"[1] over [5]".

Jurchen *nilhun* (Janhunen) = *nül-xon & ni-xun* (Miller) "16" and Manchu *niolxun* "16th day of the first month" cannot be directly derived from any Mongolian source. Janhunen solves it by postulating pMo **nil-* "6", which had to be replaced by **ǯiryuγan* "6", for its transparent internal structure interpreted as an innovation. But Janhunen himself admits a proximity of Tg "6"

and South Tg "16", explainable as a common Tg heritage. If we accept this idea, the reconstructions **ńöl-gün* "6" and South Tg **ńol-xun* "16" are possible. The irregular development of the cluster **-lg-* (see Benzing 1955: 45 about regular responses) could be caused by the influence of the preceding numeral **tuńŋa* or perhaps by nasal assimilation **ńölgün* > **ńöŋgün* ? The development from **ńöl-ǯün* *"6 [subtracted from] 10" is also in principle possible, cf. Oleni Evenki *nucun*, and Jurchen (Mudrak) *niuŋǯu*? The root **ńöl-* //**ńol-* has no convincing internal Tungus etymology (Evenki *ńol* "big, large, great; rough" ? — see TMS I: 643; cf. also WrMo *neliyen* "much, enough, large").

There are promising extra-Tungus parallels. OJp *mu-* "6" has been derived from **ńu-* (Starostin 1991: 78, 141; Vovin 1994: 106). On the other hand, this numeral can be derived by internal apophony from OJp *mi-* "3" — cf. the pairs 1 : 2, 3 : 6, 4 : 8 (Miller 1971: 237; Syromiatnikov 1981: 71; already Schott 1853: 11). Starostin 1991: 141 also speculates about a relationship of MKor *'yəsïs* "6", assuming an early loss of **n-*. The second candidate could be MKor *nəyh* "4". The loss of the expected **-r-* can be analogical to *səyh* "3" vs. *syərhĭn* "30" (Krippes 1991: 149 reconstructs pSilla **siri-k* & **siri-k-on*). The semantic difference "4" vs. "6" is also explainable, if we accept a subtractive model in Tg, i.e. 6 = [10] — 4. The form **ńöl-* "4" can represent an original Altaic numeral "4" with very attractive external cognates — in Fenno-Ugric **ńeljä* "4" (UEW 316) and Dravidian **nāl* "4" (Tyler, *Lg* 44[1968]: 807), while the most wide-spread form **dör[i]* "4" seems to be an innovation with the inner Altaic etymology (cf. ## 4, 22).

An indirect support of the original semantic structure of the numeral "6" is attested in Lamut (= Even) of Kamchatka Bay, where Messerschmidt and Strahlenberg recorded *ďegen // degen* "4" vs. *ďgalkun // dagalkun* "6" respectively. If the element *-l-* reflects the ablative suffix **-lā-kï-*, this innovated numeral probably represents a subtraction *"4 [subtracted] from 10" ?

With respect to the promising Chukcho-Koryak etymologies of the numerals "7" & "9", a hypothesis of the same origin for "6" is not so heretic. In fact, there is a good candidate in Koryak (near Karaga Isl.) *nun-malan* "6" (= "1 + 5") or Chukchi (Steller) *annyan-millgin* etc. (Anderson 1982: 32).

36. Tg **nadan* "7" is reconstructed quite unambiguously. The only rather deviated form *nadun* in Oleni dialect of Evenki (Strahlenberg) is explainable by the influence of *nucun* "6" and *ziapkun* "8". The numeral has been compared with OJp *nana-* and Koguryŏ (Murayama) *nanun* "7" (Miller 1971: 242). Starostin 1991: 141 adds Tk **jätti* (< **jäddi* in his transcription) and MKor *nir-kup* "7". Regardless of evident phonetic problems of this comparison, Starostin, Dybo & Mudrak 1995: n. 692 reconstruct pAlt **nad[i]*. On the other hand, Miller 1971: 242 assumes a borrowing from Mongolian, reconstructing the following, rather risky, development: pMo **daluγan* "7" > **laduγan* > **ladaγan* > pTg **nadan* > pJp **nana-*. Regardless of this not too convincing

attempt, the idea of a foreign origin of the numeral from the interval 6÷10 without any promising internal etymology is doubtless fruitful. It is remarkable that the numeral "7" has been borrowed in more language families: Indo-European and Kartvelian from Semitic, Fenno-Permian from Baltic (or early Slavic according to Napolskikh), Ugrian from Indo-Iranian (or Tocharian according to Napolskikh), Samoyed from Tocharian, South Cushitic from Bantu, East Cushitic from some Nilo-Saharan source (Surma ?), etc. Consequently it is quite legitimate to seek some non-Altaic neighboring or substratal donor-language. One candidate is certainly the Nivkh language, a substratum for the Tungus languages from the basin of lower Amur. But the form *ŋamg* "7" cannot be a source of the Tg **nadan*. Similarly Yukaghir, a substratum for some northern Even dialects, can be excluded (cf. Tundra *puskij-*, Kolyma *purkij-*, orig. "2 over [5]", where *kij-* = "2", Kolyma *pure-* "top", see Krejnovič 1982: 114). The last candidate, Chukcho-Kamchatkan, represents probably the oldest recognizible stratum preceding the Tungus languages. Burykin 1984: 20–23 collected more Tungus etymons without Altaic cognates but with hopeful Chukcho-Koryak parallels. And really, in Koryak (Pallas) *nyettan-myllaŋa* "7" (= 5+2, cf. *hittaka* "2" & *myllaŋa* "5"), Koryak of Karaga Isl. (Pallas) *ńyttyaka-šit* "7" vs. *nityakaw* "2" or Itelmen of Tigil River (Billings / Sauer) *nittanoo* "2" (< Koryak ?) vs. *ittax-tenu* "7" (Anderson 1982: 30–31) etc., a source with a transparent etymology can be found.

Jurchen *dalhûn* (Janhunen) = *daRxwan* (Mudrak) "17" and Manchu *dorxon* "seven-years-old boy" are apparently of Mongolian origin (Janhunen 1993: 176 in contrary to Miller 1975: 147, seeing here an original Altaic archaism).

37. Tg **ǯabkun* "8" must be reconstructed with **-b-* . The change **-bk-* > **-pk-* is certainly more natural than the change **-pk-* > **-bk-*, presumed tacitly by Benzing or Starostin. The forms with **-b-* are really attested in Solon (Ivanovskij) *ǯabkún*, Lamut (Witsen) *ǯiabkan*, Lamut of Aldan (Billings) *digkabkan* (!). Starostin 1991: 141 segments his Tg reconstruction **ǯa-pku-n* "8", comparing it with OJp *ya-* "8" < **da-* without any deeper analysis. Ramstedt proposed two etymologies:

(i) **ǯab-* is identified with Evenki *ǯabdar* "long" (TMS I: 239), while the second component has to be borrowed from Sino-Korean *kon* "eldest (brother)"; Ramstedt supposes the following semantic development: "long brother" > "long finger" > "middle finger" > "8" (1949: 77; 1982: 89); there is a more elegant solution, identifying the second component with Tg **xuniakān* "finger" (TMS I: 276–277; Benzing 1955: 59), hence **ǯab-kun* *"long finger" (a medial allophon of pTg **x-* is **-k-*, cf. the rule 22).

(ii) **ǯ-ap-kan* (sic) < **ǯu(r)-ap-* "2 before [10]", in analogy with Kor *yətărp* < **yər-tur-ap* "10–2-before", i.e. "2 before 10" (Ramstedt 1982: 19). This etymology can also be modified and so supported. Accepting the reconstruction **ǯabkun*, the segmentation **ǯV-* "2", **aba* "no, not" (TMS I: 3) and **-kun* is possible. The function of the last segment remains open. The same

-kun also forms the puzzling Lamut of Kamchatka Bay numeral *d'galkun // dagalkun* "6", where the internal structure "4 subtracted from 10" is almost evident (see Tg "6"). It is tempting to assume that the enigmatic numerals 12–19 in South Tungus languages are terminated by the same suffix **-kun*. If we accept their identity, the meaning "10" of **-kun* is compatible with both its functions. This hypothetical conclusion has no evident support in the Tungus languages. Perhaps only the quoted Tg **xuńakān* "finger" with the diminutive suffix **-kān*, which can be interpreted as a singulative. Hence the shortened form could mean *"[all] fingers" > "10".

Let us mention that Panfilov 1973: 9 reconstructed pNivkh **xon* "10". Can it be the source of the suffix **-kun* ?

38. Tg **xüńägin* "9" should be reconstructed with **-ń-* instead of **-y-* (Benzing) on the basis of the forms *unjun* "9" and *kunjun-tzu* "90", recorded by Strahlenberg (1730) in one South Tungus dialect named Tongusu-Konni. The puzzling Jurchen *oniohûn* (Janhunen) = *onioxwan* (Mudrak) "19" also supports this reconstruction. The first component **xüńä-* suggests the stem **xuńa-* "finger". The front vocalism could be caused by the suffix **-gin*, terminating perhaps also the numeral "4". An alternative solution can be represented by a substratal origin similarly as in the case of the numeral "7". A promising source appears again in the Chukcho-Koryak languages: Chukchi (Bogoras) *qonyá-čyŋken*, Oleni Koryak *xoia-čankin*, Paren Koryak *qońḥay-čyŋ ken*, Kerek *qunhay-čiŋi* "9" etc. (Anderson 1982: 30, 51, including the comparison of Koryak and Tungus numerals "9").

Miller (1971: 237) finds a cognate of Tg **xüyägün* (Benzing) "9" in OJp *kökönö-* "9", assuming the multiplication "3x3". But he is not able to explain the difference between initial Tg **x-* and Mo *γ-* in *γurban* "3". Starostin 1991: 141 reconstructs pTg **xegün* "9" for an easier comparison with OJp *kökönö-*, not respecting the forms as Jurchen *hujehun* or Evenki of Lower Tunguska *ijógjin* and the forms documenting the reconstruction **-ń-*. It is interesting that this comparison does not appear in the *Comparative dictionary of Altaic languages* prepared by Starostin, Dybo & Mudrak.

Poppe 1960: 32–33 rejects the initial pTg **x-* and reconstructs **yegün*, comparing it with pMo **yersün*.

39. Tg **ǯuwan* "10" can be compared with Mo **ǯaγ/wun* "100" (see above) or with OJp *töwo* "10", implying in that case pAlt **č-* (Starostin 1991: 141 reconstructs pAlt **čuwa* "10", while Vovin 1994: 106 **čuba-*; already Miller 1971: 220–221, 236 thought of this connection, speculating about pAlt **d-*). This numeral remains etymologically unexplained. Ramstedt's derivation from the verb **ǯuwan-* "to open" would be perhaps acceptable but the correct meaning is "to yawn". The comparisons with Kor *čjuŋ* "all (of numerals)" or *čoi* "all, alltogether, entirely" are phoneticaly and semantically plausible but they are too isolated (more see Mo "100").

Properly Tungus etymology cannot be excluded either — cf. Manchu *uǯan* "end, edge, limit, top" (TMS II: 250) and *uǯu* "head, beginning" > "the first" (Benzing 1955: 104; Poppe 1960: 63 finds cognates in WrMo *üǯügür* "Spitze, Oberende", MMo *üǯü'ür* "Ende"), perhaps **uǯu-an* > **ǯu(w)an* *"end of right [hand]" (cf. Tg **an-* "right" — see TMS I: 40–41).

40. Even **mïan*, pl. **mïar* "10" (TMS I: 534) forms also tens, cf. Even (Lamut in AP) *ǰyúr-men* "20", *elán-men* "30" = (Maydell / Schiefner) *dyor myär* "20", *elán myär* "30". The closest cognates can be OKor (pSilla) **tu-mur-* "20" (Krippes) and MKor *mańon* "40" (Vovin) < **nay-mon* or **na-mion*? Ramstedt 1982: 105 compared it with Kor *măn* "hand", *mandi-* "fingern, mit den Händen betasten" and the suffixes *-man / -ban / -ben* terminatig Mongolian numerals 3, 4, 8, 10. But there are at least alternative possibilities: (1) Kor *mān* "amount, size, measure, number", compared by Ramstedt (1982: 105) with the Tg suffix **-mān* (e.g. **mïar-man* "ten series" — TMS I: 534); (2) Kor *manhi* "much, many", MKor *mān-hă*, related to OJp *mane-si* "many, numerous" and perhaps Chuvash *mŏn* "big" (Ramstedt 1982: 106; Martin 1966: 41–42; Starostin 1991: 94–95, 144–145).

41. NTg **ńamā(ǯi-)* "100" is phonetically compatible with OJp *momo* < pJp **muàmuà* "100; a big number" and OTk *jom-yï* "all" (Starostin 1991: 78 reconstructs pAlt **ń[ua]mV* "a big number; 100"). Formally Mo **nayiman* "8" could perhaps also be added, although the difference in semantics remains puzzling (cf. the similarity of the numerals "8" and "100" in Sino-Tibetan). The Japanese word suggests an original reduplication. It is possible to imagine e.g. Even **mïan* "10" reduplicated in the form ***mïanmïan-* "10 x 10", giving NTg **ńamā-*. On the other hand, the metathesis **mïan* > **ńam-* cannot be excluded either, cf. Manchu *niaman* "heart" < Tg **mïawan-* (TMS I: 533–534). In that case the suffix **-ǯi(n)* can represent a reduction of the numeral **ǯuwan* "10", cf. e.g. Evenki of Lower Tunguska *nemá-dje* "100", where the same suffix terminates the numeral *mukónn-dje* "11", *djuhr-dje* "12", *ilán-dje* "13" (AP). The final *-n* is preserved in Evenki of Barguzin *njamá-ǯin* "100" (AP). On the other hand, in the suffix **-ǯi* the instrumental can be identified, forming also the collective numerals (Benzing 1955: 106).

An unexpected, suggestive, but probably unrelated parallel appears in South Lappic dialects, where *n'imme*, *n'ümme* etc. denotes "100". Its etymology is apparent: Uralic **nimi* "name" (Finnish *nimi*, Hungarian *név* etc. — see Honti 1993: 149).

42. STg **taŋgū* "100" is very probably derived from the verb **taŋ-* "to read, count", cf. Evenki *taŋū* "number"; Manchu *taŋgu* means both "100" and "quantity" (TMS II: 161–163). Nivkh (Amur) *r'aŋga* "much, many", *ń-r'aŋq* "one hundert" is undoubtedly a borrowing from South Tungus (Bouda 1960: 402).

Korean numerals

Besides the studies of Ramstedt devoted to Korean etymologies including numerals (1949, 1982), probably only Junker (1953) analyzed especially the Korean numerals (Krippes 1991: 150 quotes his not yet published study "The Phonetic History of Korean Numerals". *Korean Linguistics 7*).

	Modern Korean	Middle Korean		Proto-Silla
	Lee 1977: 248	Lee 1977: 174	Vovin 1993: 248–249	Kripes 1991: 149
1	*hănna*	*hănnah*		
2	*tur*	*turh*		**tubur*
3	*səys*	*səyh*	*sey(h)*	**siri-k*
4	*nəys*	*nəyh*	*ney(h)*	
5	*tasăs*	*tasăs*		
,6	*yəsăs*	*'yəsĭs*		
7	*nirkop*	*nirkup*		**nir-k*
8	*yətărp*	*'yətïrp*		**yutur*
9	*ahop*	*'ahop*		
10	*yər*	*'yərh*		
20	*sĭmŭr*	*sĭmŭr*		**tumur-on*
30	*syərhĭn*	*syərhĭn*		**siri-k-on*
40	*mahĭn*	*mazăn*	*mañon*	
50	*suyn*	*suyn*	*swin*	
60	*yəsyun*	*'yəsyuyn*	*yey.sywuyn*	
70	*nirhĭn*	*nirhĭn*		**nir-un*
80	*yətĭn*	*'yətĭn*		**yutur-un*
90	*ahĭn*	*'ahăn*		
100	(*păik* < Chinese)	*'on*		

Comparative-etymological analysis

43. MKor *hannăh* (Lee) > NKor *hannā* "1" consists of the numeral proper and the numerative *nā* with a probable meaning "piece, face" (Junker 1953: 301). The closest cognate represents Manchu *sonio* "one, a single", *sonixon* "single, not in pairs", *son son i* "one by one, each for itself" (Ramstedt 1949: 60 compares also Ainu *shi-ne* "1" which is probably of Austric origin); cf. further WrMo *sonduγai* "odd", OTk *sïŋar* "one of a pair" (TMS II: 111; Räsänen 1969: 417; Starostin 1991: 296). Starostin's reconstruction of pAlt **s(i)onV* "one, single" can be modified in **soṇiV*.

44. MKor *turh* (Lee) = *tūrh* (Starostin) = early MKor (Nichû-reki) *tufuri* "2" < OKor **tüpɔ̈r* ~ **tüβɔ̈r* (Lee) = **tubur* (Krippes) = **tubɨr* ~ **tuwɨr* (Starostin) < pKor **twubwu-l* (Vovin 1994: 106) is compared with Tg **ǯöwä-(r)* "2; pair", Mo **ǯirin* "2" (about women) (Ramstedt 1949: 274–275, Id. 1957: 65; Starostin 1991: 33). Martin 1966: 245 adds OJp *tur-e* "companion" (he and Ramstedt also speculate about Ainu *tu* "2" but also here a hopeful Austric etymology exists). Tk **düř* "equal" and **[d]üŋ* "pair" can be related too (see Mo "2").

MKor *sïmïr* "20" looks like a form quite different from the numeral "2". Ramstedt 1949: 238 compared it with Manchu *simxun* "the fingers and toes — of man". Krippes' reconstruction of pSilla **tumur-* opens a possibility to connect it with the numeral "2" itself. It is tempting to see here the same structure as e.g. in Even of Oxotsk (AP) *ǯur-mer* "20". Unfortunately, Krippes does not present any evidence for his reconstruction.

Miller 1996: 145 compares *-mïr* in *sïmïr* "20" (in his transcription *sŭmŭl.h-*) with Tk **-mïl*$_2$ forming the numerals "60", "70" (see # 15). He finds a support for the primary meaning "ten" in NKor *mŭs* "(a bundle of) ten (sheaves, fish, etc.); a plot of land from which ten sheaves of tax-grain are collected".

45. MKor *səy-h* (Lee) = *sɔ̄i* (Starostin) "3" must be reconstructed with **-r-* preserved also in *syərhïn* "30" (cf. pSilla **siri-k* "3" and **siri-k-on* "30" reconstructed by Krippes 1991: 149). Ramstedt (1949: 225 and 1957:65) compared it with Manchu *sertei* "one with three lips" (TMS II: 146) and WrMo *serege, serige, seriye* "trident, threepronged; fork", Khalkha *serē*, Kalmyk *serə̄* "Dreizack, Gabel" (Ramstedt 1935: 325); Mo > Teleut *särä*, Soyot *serē* "Harpune" (Räsänen 1969: 411). Starostin, Dybo & Mudrak 1995, n. 1002 add Turkish *saz* "three-stringed instrument", although they do not exclude its Persian origin.

The etymology is not solved. One possibility represents Tg **siru* "span" (the distance between thumb and forefinger) (TMS II: 80). The semantic motivation for the denotation of the numeral "3" can be based on the fact that the remaining fingers form a triple set of neighboring fingers. NKor *sur* < **səru* (?) "finger" (Ramstedt 1949: 245) and Tk **särä* "span" ("the distance between thumb and forefinger" in Oghuz group against "the breadth of four fingers" in Kyrgiz, Kazakh, Uzbek) (Räsänen 1969: 411) are probably also related. Dybo 1986: 54, studying the system of spans in Altaic languages, draws attention to Fenno-Ugric **sorV(-śV)* "span" vs. Fenno-Volgaic **sorme* "finger" (UEW 448, 765).

An interesting external parallel appears in Nivkh **ťe* "3" (Panfilov 1973: 9), although its relationship is not unambiguous.

Vovin 1993: 252, 256 comes with a revolutionary reinterpretation: he judges that the Korean initial *s-* in the numeral "3" reflects pAlt **ń-* ! His main argument is based on Kor *tuə* "some few", traditionally derived from *tu* "2" & *sə* "3" (Ramstedt 1949: 275). Vovin modifies the Middle Korean reading of this word in *two.ńe(h)*. His reading of the "triangle" sign as *-ń-* looks convincingly for the medial position. But the conclusion pAlt **ń-* > MKor *s-/-ń-* cannot be supported for the initial position by other Korean - Altaic comparisons. All the presented hopeful etymologies are in agreement with the rule 20. The only example of Vovin supporting his idea is the comparison of MKor *-ńe* "3" & OJp *mi-* "3". His reconstruction of Tg **ńïl-an* "3" is quite artificial. Perhaps the Tg numeral **ńö[l]gün* "6" (if it means 2x3 as in Mongolian?) would fit better.

46. MKor *nəyh* "4" has no convincing etymology within Altaic (Ramstedt's attempt to connect it with Evenki *növarkana* "four-years-old reindeer" — see 1982: 121 — must be rejected) with the hypothetical exception of Tg **ńö[l]gün* "6", if the internal structure was "10 minus 4" (see Tg "6"). Kho 1975: 108 connects the Kor "4" with Fenno-Ugric **ńeljä* "4". Menges 1975: 92 adds Dravidian **nāl* "4" besides the old comparison of Boller (1857) with Jp *yo-* "4" and even Samoyed **tettə̑* "4", very probably of Turkic (Old Bulgarian) origin (Blažek 1998: 7). The loss of the expected **-r-* can be explained in a similar way as in the case of the preceding numeral, cf. also pSilla **narih* "river" vs. MKor *nayh* or **murih* "mountain" vs. later MKor *moyh* (Lee 1977: 80). Together with Nivkh *ny-/nu-* "4" (cf. also *ń-mar-i* "quarter" <**ńi-nar* $^1/_4$ and *mi-nr* "8" = 2 x 4 — see Bouda 1960: 358) and Dravidian **nāl* "4", a specific East Nostratic isogloss can be preserved here.

Miller 1996: 116 mentions the puzzling MKor forms for "4" written in Japanese *kana*-syllabic script, namely *towi*, *toFi*, *toi* (according to the book Nichû-Reki, AD 1139, *towi* means "3", while "4" is *sawi*; the correct order should be evidently opposite, similarly as in the case of "5" and "6" — see Lee 1977: 101), finding in it a genuine correspondent of Mo *dörben* "4" etc. (# 22).

MKor *mazăn* "40" in the traditional transcription (Lee) looks very strange in confrontation with *nəyh* "4". Vovin 1993: 248, 255 convincingly demonstrated that the correct reading must be *mańon*. It is supported by early MKor source KYELIM YUSA (A.D. 1102–1106) written phonetically in Chinese characters, where the numeral "40" is transcribed *mae.nyin*. The form *mańon* "40" is compatible with *ney(h)* "4" (Vovin) in case of a metathesis from ***naymon* or sim. The hypothetical second component ***-mon* agrees fully with pEven **mïan*, pl. **mïar* "10" (TMS I: 534), forming also tens: Lamut (= Even) *dügün-men* "40" etc. (AP).

47. MKor *tasăs* "5" can be analyzed as a compound of *tā* "all, every one" & *son* "hand" (Ramstedt 1949: 245, 258–259 sees in the first component a derivative of the verb *tatta* "to open"), hence "[the fingers of] whole hand" (Ramstedt 1949: 77; Junker 1953: 302–303), cf. also Tg "5". The second possibility represents a comparison of the component **ta-* with the numeral "5" in other Altaic branches: Mo **tawu-* // Tg **tu(a)ńŋa* // Koguryŏ *utu*, OJp *itu-* (Miller 1971: 221; Starostin 1991: 70).

MKor *suyn* (Lee) = *swin* (Vovin) "50" supports the point of view that the bearer of the meaning "5" in *ta-săs* is more probably the second component derivable from *son* "hand". The deviated forms *kaseto* "5" (Witsen) or early MKor (Nichû-reki) *hasusu* "6", correctly "5" (Lee 1977: 101) can be interpreted as erroneous records. On the other hand, a different prefix could also be identified here, cf. e.g. the connecting particle *ka* (Ramstedt 1949: 80–81).

48. MKor *'yəsïs* "6" has been segmented *'yə-sïs*. Ramstedt 1949: 77 connects the second component with *-săs* forming the numeral "5", hence ulti-

mately with *son* "hand". In the first component he sees the verb *yəlda* "to open" or its derivative (after Ramstedt) *yər* "10", cf. *'yətĭrp* "8" < **'yər-tur-əp* "ten-two-lacking" (Miller 1971: 244). It is certainly possible, only the semantic function of *-sĭs* remains open.

The other possibility follows from the law described by Vovin (1993: 250–252): the medial **-ń-* became *-s-* in southern and Hamkyeng dialects and this change also influenced the central dialects. It means that the attested MKor form *'yəsĭs* could originate from **yəńĭs* (the influence of the preceding numeral *tasăs* "5" must be also taken into account), suggesting a hypothetical archetype **yər-ńəy-əp(s)* *"ten-four-lacking".

Starostin (1991: 141) speculates about the loss of **n-* assuming an original archetype **njə-*, to be compared with Tg **ńu-ŋu-n* "6" (Starostin) and OJp *mu-*.

49. MKor *nirkup* "7" was analyzed as **(n)ir-* (cf. SKor *ilgop*) & **-kop* "three bending" by Ramstedt 1949: 77, 124, 167, cf. Evenki *ilan* "3". Miller 1971: 244 proposes his own solution, which agrees with the internal structure of all the numerals 6–9: *yər-*ŋu-əp(s)* "ten-three-lacking". It is interesting to confront it with the record of Witsen (1705) *yer-op-čil* "7" (Anderson 1982: 58). Starostin 1991: 141 compares the first component *nir-* with Tg **nadan*, OJp *nana-*, Tk **jätti* "7", explaining either the internal structure of all the word or the phonetic differences. Ogura (quoted after Ohno 1970: 132) sees here a transformation of WrMo *doluγaburi* "forefinger".

50. MKor *'yətĭrp* "8" was analyzed as **yər-tur-əp* "ten-two-lacking" (Ramstedt 1949, 76–77; Miller 1971: 244), cf. Kor *əp(s)* "to be lacking" (Ramstedt 1949: 56). Junker 1953: 306 admits a relationship to Jp *yattsu*, OJp *ya-tu* "8". Tg **ǯabkun* "8" can be analyzed in a similar way, i.e. **ǯ(u)-ab-kun* "two-lacking of-ten"?

51. MKor *'ahop* "9" is not so transparent as "8", but Miller 1971: 244 is probably right when deriving the numeral from a compound of the same internal structure as all the numerals of the interval 6–9: **yər-hăn-əp* "ten-one-lacking".

Ramstedt 1949: 77 derives it from NKor *a* "child" and *kop-* "to be crooked", hence "the little one bent". Junker 1953: 306 noticed that one would expect **agop* in this case.

52. MKor *'yərh* (Lee) = *yə́r* (Starostin) "10", together with *yərə́h* "a big quantity, number" (Starostin), have hopeful Altaic cognates: Tk **jŭ̄r* "100" // Mo **yersün* "9", **yerin* "90" besides WrMo *yerü* "the most of..." // OJp *yorodu* "10.000" (see Tk "100" and Mo "9"). The meaning of the pAltaic archetype **yeřü* "could be "the greatest [number]" or sim.

53. MKor *'on* "100" has the closest cognate in Tk **ōn* "10" (Ramstedt 1949: 177). The final component **-on*/**-un* (pSilla reconstructions of Krippes) forming

tens (cf. the termination **-an /*-in* of tens in Mongolian) represents probably the same stem. It means that its meaning should be "ten". In that case the original form of the numeral "100" in early Korean was **yər-on* "the biggest ten", similarly as in Tk the numeral **jŭ̄ř* "100" can represent a reduction from the original **jŭ̄ř-ōn* "the biggest ten" (cf. Ramstedt 1907: 19). The most hopeful etymology of the Tk-Kor issogloss leads to MMo *ono-* "zählen" (Haenisch 1939: 125; see Tk "10"), hence the original meaning was probably *"number".

Japanese numerals

Japanese numerals were specially studied in Miller 1971: 219–245.

	Japanese	Old Japanese	Proto-Japanese	Koguryŏ			
	Modern	Pallas #166 (*)	Miller 1971: 220	Starostin 1991	Murayama	Lee	Miller 1971: 239–41
1	*hitotsu*	*fto-c*	*fitŏ-tu*	**pitə-*			
2	*futatsu*	*vta-c*	*futa-tu*	**puta-*			
3	*mi(t)tsu*	*mi-c*	*mi-tu*	**mi-*	**mi(l)*	**mir*	< **mit*
4	*yottsu*	*yu-c*	*yŏ-tu*	**də-*			
5	*itsutsu*	*isy-c*	*itu-tu*	**ltù-*	**utu*	**üc*	
6	*muttsu*	*mu-c*	*mu-tu*	**mu-*			
7	*nanatsu*	*naka-c*	*nana-tu*	**nànà-*	**nanun*	**nanən*	
8	*yattsu*	*ya-c*	*ya-tu*	**da-*			
9	*kokonotsu*	*nogono-c*	*kökönŏ-tu*	**kəkənə-*			
10	*tŏ*	*to*	*töwo*	**təwə*	**tę(k)*	**tęk*	
-ty	*so*		*-so-ti*	**-so*			
100	*momo*	*inyagu*	*momo*	**muàmuà*, cf. Ryukyu *mumu*			

* The dialect of Japanese sailors shipwrecked near Oxotsk (Pallas 1787: XIV).

Comparative-etymological analysis

54. OJp *fitö-* < **pitə-* "1" is reelated with Tk **bĭr* "1" // Mo **büri* "all, each" // MKor *pĭrɨs(ó)* "at first", *pĭrɨs-* "to begin" (Martin 1966: 238; Miller 1971: 230; Starostin 1991: 99; 73 about the change **-r-* > Jp *-t-*; he opines that Mo *ü* is secondary).

Murayama and Kawamoto connect Jp "1" with Austronesian **it'a?* "1", postulating a prefix **p-* (a discussion and references see Starostin 1991: 99).

Benedict 1990: 225 finds a cognate of Jp "1" in Austronesian **pi[t.]oŋ* "one-eyed".

55. OJp *futa-* < **puta-* "2" can be compared with MKor *pčàk* "pair" > mKor *ččak* id., cf. *ipčak* "this side" (Ramstedt 1949: 19) and Tk **bučuk* "half" (Räsänen 1969: 85; Sevortjan II: 283–284) — see Starostin 1991: 109.

An alternative comparison of Murayama and Kawamoto with Austronesian **pat'aŋ* "pair" looks more hopefully than their Japanese-Austronesian comparison for "1" (quoted after Starostin 1991: 109). Concerning the different root vocalism, cf. Jp *futsuka* "20th day [of the month] vs. *hatachi* "20 years old" (Miller 1971: 226).

Benedict (1990: 227, 257) differentiates the Austronesian cognates of (1) OJp *futa-* "2", and (2) *fata-* "20", which should be (1) pTsouic **-pusa-* "2 (years, nights, etc.)" and (2) Austronesian **pats$_{123}$aŋ* "pair" respectively.

Miller (1971: 230) speculates about unattested pJp **yuta-* "2", changed into **puta-* under the influence of **pitə-* "1". This hypothetical form has to be compatible with MKor *turh* and Tg **ǯöwār*.

56. OJp *mi-* (Miller) = *myi-* (Martin; see Vovin 1993: 256) "3" has no convincing etymology. The only evident cognate is Koguryŏ **mi(l)* (Murayama) = **mir* (Lee) < **mit* (Miller) "3". The puzzling root **mu-* isolated from the unique form *mugina-ǯian* "30" attested by Witsen (1705) in Lamut (= Even), could also be related. It is tempting to add Dravidian **mūṉ-* "3", originally perhaps named after *"protruding [finger]" (Andronov 1978: 242). Menges (1975: 92–93: Jp+Dr) also mentions Burrow (*BSOAS* 11[1943]: 334), comparing the Dravidian "3" with Samoyed **nākur* "3" (see Mo "3").

Vovin (1993: 252, 254) proposes a rather risky comparison of Jp "3" with MKor *sey(h)* & *-ńe* "3" < **ńe*[ ]*i* and Tg **[ń]ïlan* "3" (there is no evidence for **ń-* = **s-*).

Miller (1971: 238–239) is probably wrong, connecting the Japanese-Koguryŏ isogloss "3" with Tk **ūč* "3" (Menges 1975: 93).

57. OJp *yö-* "4" has been derived from pJp **də-* and compared with Tg **duj-gin* // Mo *dör-ben* // Tk **dȫrt* (Starostin 1991: 71 reconstructs pAlt **tūr* ~ **tōr*; about the loss of *-r-* see p. 73; similarly Vovin (1993: 106), reconstructing only pAlt **tV-*, while Miller 1971: 221 presents the archetype **dör-*; cf. also Murayama 1962: 108 and 1966: 154 **dȫ-*).

Rahder, MN 8[1953]: 265 connects Jp *yö-* with Kor *nəy-* "4", demonstrating the vacillation *n-* ~ *y-* by examples, like e.g. OJp *nubu* "to sew" vs. *yubu* "to bind" // Kor *nupi-* "to quilt, stitch"; he quotes (p. 285) the point of view of H. Izui concerning a common origin of Japanese, Korean and Fenno-Ugric numerals "4" (see Kor "4"). Similarly Menges 1975: 92 and Kazár 1980: 210–211 compare OJp *yö-* with Fenno-Ugric **ńeljä* "4", and eventually also with Samoyed **tettə* "4" (Janhunen 1977: 159). But the latter form is apparently borrowed from some Turkic language of a Bulgarian-Chuvash type (Blažek 1998: 7).

Benedict 1990: 196 derives OJp *yö-* from a reduplicated form **yöyö-* and connects it with Austronesian **(x$_2$ə)x$_2$əpat* "4" !

58. OJp *itu-* "5" has been compared with the numeral "5" in other Altaic branches (excluding Turkic) with initial *t-*: Mo **tawu-* // Tg **tu(a)ńŋa-* //

MKor *tasăs* (see above). But a vowel preceding *t* appears only in Koguryŏ *utu* (Murayama) = *üc* (Lee) "5" and Old Bulgarian **etə* "5" (Mudrak) and perhaps in puzzling Chagatai *ittik* "50" (see Tk "50"). Vovin tries to reconstruct **i-* in Tg, postulating the following development **ituŋa* > **tʲuńŋa* > STg **cunǯa*. There is also an interesting extra-Altaic example in Eskimo *itu-mak* "the palm of the hand" (Thalbitzer, *JSFOu* 25/2[1908]: 23). On the other hand, Starostin 1991: 138, fn. 138 (sic) thinks that *i-* appears secondarily influenced by the numeral *i* & *i-so* "50" (origin ?).

Rahder, *MN* 9[1953]: 238–239 sees in *i-* a relic of ***in* corresponding to Palau *im*, Atayal *ima-* "5" < Austronesian **lima'* (cf. also Benedict 1990: 206).

It was already Boller (1857) who compared Jp *itu-* with Fenno-Ugric **wĭt(t)i* "5" (Sammallahti 1988: 489) = **witte* (UEW 577), related to Samoyed **wüt* "10" (Janhunen 1977: 177; Sammallahti 1988: 541 reconstructs pUralic **wit(t)i*) — see Menges 1975: 95 (Jp+FU), Kazár 1980: 60 (Jp+Ur). This comparison could be acceptable also from the point of view of the Nostratic hypothesis, assuming a regular correspondence Uralic **w-* vs. Altaic **∅-//*b-*, depending on the following vowel (Illič-Svityč 1971: 150).

59. OJp *mu-* "6" has been traditionally connected in one pair with *mi-* "3" (Schott 1853: 11; Miller 1971: 237–238; Menges 1975: 92; Ivanov 1977: 36; Syromiatnikov 1981: 71).

Starostin 1991: 78, 141 compares *mu-* with the Tg counterpart reconstructed and segmented by him **ńu-ŋu-n* "6" (similarly Vovin 1993: 106).

Menges 1975: 94 mentions Boller, the first one to compare Jp *mu-* "6" with Samoyed **mə̑ktut* "6" (Janhunen 1977: 85), cf. also Kazár 1980: 108. But the Samoyed numeral is etymologizable on the basis of Samoyed **mə̑kå* "back" (Janhunen l.c.), similarly as Fenno-Ugric **kŭt(t)i* "6" vs. **kuttV* "back" (UEW 225); hence "6" = "beyond [5]" is quite plausible (Blažek 1998: 8).

60. OJp *nana-* "7" together with Koguryŏ **nanun* (Murayama) = **nanən* (Lee) "7" has been compared with Tg **nadan* "7" (Rahder, *MN* 8[1953]: 281; Murayama 1958: 229; Hamp 1970: 197; Syromiatnikov 1981: 71; Starostin 1991: 141; Vovin 1993: 106). None of them offers any further etymology. Miller (1971: 241–242) sees borrowings in Japanese & Koguryŏ numerals "7", together with the Tungus counterparts, ultimately from some Mongolian source (see #36).

Our hypothesis of the borrowing of Tg **nadan* "7" from some substratal source, probaly of a Chukcho-Koryak type, also implies a similar origin or a cultural diffusion for the Japanese — Koguryŏ isogloss. Anderson 1982: 42 mentions a set of very strange Japanese numerals compiled in the *Comparative dictionary* of Pallas (1787) there is, including *naka-c* "7". Anderson's interpretation "2+[5]" has no concrete support within Altaic, but it is explainable thanks to Chukcho-Koryak, cf. e.g. Koryak (Krašennikov) *ńĭ́akoletenyak*,

Oleni Koryak *niyax-malagan*, Koryak of Kamenskoe *ŋáa-mɔ́dləŋen* "7", in both of the last examples evidently "2+5" (Anderson 1982: 30).

On the other hand, in the case of this deviant form, it is possible to imagine a contamination of the properly Japanese numeral with Nivkh *ŋamg* "7".

61. OJp *ya-* "8", frequently also "several" (Syromiatnikov 1981: 71), has been derived from *yö-* "4" by means of an "internal apophony" (Miller 1971: 231; Syromiatnikov 1981: 47, 71). At the same time, Miller l.c. connects it with Tg **ǯabkun* "8", similarly Starostin 1991: 141; Vovin 1993: 106. But Tg **ǯabkun* probably represents an innovation with the inner Tungus etymology (see above). It is remarkable that elsewhere Miller compares the Tg "8" with Jp *tako* "octopus" (1971: 85).

Kazár 1980: 208–209 sees a counterpart of OJp *ya-* "8" in Ugric **ńalV* "8", referring to the equation OJp *yö-* "4" vs. *ya-* "8" = FU **ńeljä* "4" vs. Ugric **ńalV* "8". This point of view seems to be the most probable, although the Fenno-Ugric example is comparable with the Japanese pair only typologically (OJp *y-* does not correspond to FU/Ur **ń-*).

62. OJp *kökönö-* "9" cannot be derived from Jp *kokodaku* (OJp **kököda-*) "very many" (Ohno), as it was demonstrated by Miller (1971: 236).

Starostin (1991: 141) compares it directly with Tg "9", in his reconstruction **xegün*, similarly Vovin 1993: 106, reconstructing Tg **xegɨn*. These reconstructions cannot explain all the historically attested forms, as it was explained above (#38). A more plausible archetype could be **xüńägin*, even closer to the Japanese form. Taking in account the deviating form *nogono-c* "9" (Pallas 1787, # 166), the hypothetical pJp **kənəkənə-* corresponds to the Tg numeral one-to-one. Above it was demonstrated that Tg **xüńägin* "9" can be analyzed as a derivative of **xuńa-kän* "finger", hence "9" = *"[one] finger [lacking]", or it can represent a borrowing from a Chukcho-Koryak substratum. On the other hand, the Japanese numeral is unanalyzable. It means that a borrowing from Tungus represnts not only legitimate, but also probable possibility.

Miller (1971: 237) sees in OJp *kökönö-* and Tg **xüyägün* (Benzing) a multiplication "3 x 3". In Tg it is improbable for phonetic reasons (see the disccussion in # 38). The Japanese numeral, esp. accepting the reconstruction **kənəkənə-*, really can be interpreted as the multiplication (see #21). The multiplication "3 x 3" forming the numeral "9" is not usual, but it does not mean that it cannot exist. E.g. in various dialects of the Yuma group of the Hokan language family just this structure is safely recognizable: Cocopa *xwak* "2", *xəmuk* "3", *xmxuk* "6" = "3 x 2", *xmxmuk* "9" = "3 x 3", Yuma *xavik* "2", *xamók* "3", *xumxuk* "6", *x"mx"mók* "9", etc. (Langdon & Munro 1980: 124–125).

Shiratori (1937) explains Jp *kokono-* on the basis of *koko* "bend" and *na* "not", hence *"not obtained by bending" (see Miller 1971: 234).

63. OJp *töwo* "10" cannot probably be derived from OJp *töwomu* "to be bent, be curved", nor from *tawomu* "bent", Jp *tawamu* "to bend, be bent" (Ohno 1955, against Miller 1971: 232).

Miller 1971: 235–236 prefers the relationship to Tg **ǯuwan* "10", starting from the initial pAlt **d-*. Similarly Starostin (1991:141) and Vovin (1993: 106), but they reconstruct pAlt **čuwa* and **čuba-* respectively, however without any attempt of etymology. Kor *čoi* "all, altogether, entirely" (see Tg "10") is compatible semantically, and with **čuwa-* also phonetically.

Elsewhere Miller (1971: 233) rejects Ozawa's comparison of OJp *töwo* "10" and WrMo *tabun* "5" for different semantics. But if we accept the most hopeful etymology of Tg **tu(a)ńŋa* "5" = *"all fingers", and its relationship with Mo **tawu-* "5", the original meaning "all [fingers of one / two hand(s)]" can also represent a primary semantic motivation for "5" and "10".

The position of Koguryŏ *tę (k)* "10" remains obscure; it is remarkable that Miller (1971: 236) prefers to connect it with OTk **tokuz* "9" (not "10"!!) rather than with OJp *töwo* "10".

Ramstedt (1982: 212) compared Jp *tō* "10" with Ainu *toe*, *toye* "many" and with Kor *tōi̯-*, *tō̄-* "to be thick".

64. OJp *-so* forms the tens 30–90. Its etymology is obscure. Ohno (1955; see Miller 1971: 227, who rejects this comparison) and Murayama (1958: 229) connect *-so* with Korean *son* "hand". Miller (1971: 227) sees here an allomorph of OJp *töwo* "10", referring to the *t-/-s-*variation described in Japanese.

Benedict 1990: 224–225 compares it with Kadai **tsia* and Austronesian **ʔitsa* ~ **ʔatsa* "1", **-tsa* "(compound) one", widespread in Austronesian in "10", "100" and "1000".

65. OJp *momo*, Ryukyu *mumu* "100" are formally compatible with NTg **ńamā-* "100" (Starostin 1991: 78 reconstructs pJ **muàmuà* and adds OTk *jumγï* "all", *yom-* "to collect" — see Sevortjan IV: 219–220). More about it — see # 41.

Abbreviations

AA Afroasiatic, Alt Altaic, AP Asia Polyglotta of Klaproth, Dr Dravidian, FU Fenno-Ugric, IE Indo-European, Jp Japanese, Kor Korean, m modern, M Middle, Mo Mongolian, N North, O Old, p proto-, S South, Tg Tungus, Tk Turkic, Ur Uralic, Wr Written.

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AOH *Acta Orientalia Academiae Scientificarum Hungaricae.*
ArOr *Archív orientální.*
Avrorin, V.A. 1959: *Grammatika nanajskogo jazyka.* Moskva — Leningrad: Izdatel'stvo Akademii nauk SSSR.
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BSOAS *Bulletin of the School of Oriental and African Studies.*
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DEDR Burrow, T. & Emeneau, M.B., 1984: *A Dravidian Etymological Dictionary.* Oxford: Clarendon Press.
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GL *General Linguistics.*
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JAOS *Journal of the American Oriental Society*.

JRAS *Journal of the Royal Asiatic Society*.

JSFOu *Journal de la Société Finno-Ougrienne*.

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Lg *Language*.

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MN *Monumenta Nipponica.*

MSFOu *Mémoires de la Société Finno-Ougrienne.*

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Todaeva, B.X., 1986: *Dagurskij jazyk*. Moskva: Nauka.
UAJb *Ural-Altaisches Jahrbücher*.
UEW *Uralisches etymologisches Wörterbuch*, 1–2, ed. K. Rédei. Budapest: Kiadó.
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ZDMG Zeitschrift der deutschen morgenländischen Gesellschaft.

INDO-EUROPEAN NUMERALS

INDO-EUROPEAN "one" and "first"

For Eva Havlová, the first lady of Czech etymology

§1. In Indo-European languages the numeral "one" was formed from one of two roots: A. **oy-*, B. **sem-*. The ordinal "first", usually derived from the root **per-/*pro-*, meant originally "fore, foremost". The most important forms can be projected in the following partial reconstructions allowing their deeper analysis.

Indo-Iranian:

A. **oy-*

**oy-ko-* "1" > Indo-Aryan **aika-* > Mitanni Aryan *aika-* in *a-i-ka-wa-ar-ta-na* "one turn" (Puhvel 1984: 14), Old Indic *éka-*, Pali *eka-*, *ekka-*, Prakrit *ikka*, *igga*, *ēa*, Hindi *ek*, Oriya *eka* besides *e* (cf. Prakrit *ēa*), Sindhi *eku* etc., Kashmiri *akh*, Shina *ĕk*, Phalura *āk*, Torwali *ek*, *ē*, Tirahi, Kalasha, Dameli *ek*, Bashkarik, Maiyan *ak*, Shumashti *yäk*, Wotapuri *yek*, Gawar *yak*, Waigali *ēk*, *ew*, Kati *ev*, Ashkun *ač*, Pashai, Khowar *ī* (cf. Prakrit *ēa*). Let us mention that the alternative reconstruction **oy-k̑o-* (Waanders 1992: 370) is also quite legitimate.

oy-wo-* "1" > Iranian **aiwa-* > Avestan *aēuua-*, Khwarezmian *ēw*, Sogdian (Buddhistic) *'yw*, (Manichean) *'yw*, (Christian) *yw*, Yaghnobi *i*, Pashto *yau*, Yidgha, Mundjan, Ishkashim *yū*, Wakhi *īu*, Shugni *yī(w)*, Sarikoli *ī(w)*, Ossetic Digor *ew*, Iron *īw*, Old Persian *aiva-*, Zoroastrian Pahlavi *ēv*, *ēvak* (aivaka*, cf. Modern Persian *yak* "1" and *yekom* "1st", already in Zoroastrian Pahlavi *ēkom* "1st", Baluchi *ēyōk* "single", *evak'ā* "alone", Sanglechi *wok*, *yak*, Yazgulam *yů(g)* "1" and further Khotanese *śśūka-* "alone", Parthian *'wg* id.), Modern Persian dial. *yaw*, Zaza *yau*, Talysh *i*; cf. also Old Indic adv. *evá* "just so", exactly corresponding to Avestan *aēuua* "so", Khotanese *ī* "indeed". The seemingly deviating forms, such as Khotanese *śśau* "1", Tumshuq Saka *śo*, Ormuri *šē*, *šə*, Parachi *žū*, represent probably the compound **wiśwa-aiwa* "all" & "one" attested e.g. in Old English *eall-āna* "alone", cf. Khotanese *biśśa-* "all".

(Abaev I: 557–58; Bailey 1979: 31, 404; Berger 1986: 26–27; Emmerick 1992a: 165 and 1992b: 291–92; EWAI I: 262–63, 270; Gonda 1953: 76–80)

B. **sem-/*sm̥-*

**sēmi-* > Old Indic *sāmí* adv. "half" (EWAI II: 725)

**somHó-* > Old Indic *samá-* "equal, the same", Avestan *hama-* "equal", Old Persian *hama-* "one and the same", Khotanese *hama-*, Zoroastrian Pahlavi and Modern Persian *ham* "the same" (Bailey 1979: 457; EWAI II: 703)

sm̥-* "one"- in compounds like **sm̥-kʷr̥t* "once" > Old Indic *sakṛt* ; Avestan *hakərəṯ* "once", Khotanese *hatārra-* "once" (ha-kr̥tna-* ?; contamined with the homonym meaning "former" < **fratara-*), Old Persian *hakaram-čiy* "jemals, wenn immer" (**hakr̥ʲ-*), Zoroastrian Pahlavi *hk(w)lč* (**hakarč*), Middle Persian (Turfan) *hgryč* (**hagriz*), Modern Persian *hargiz* "ever" (**hakr̥t + čid*).

(Bailey 1979: 448; Emmerick 1992b: 328–29; EWAI II: 683; KEWA III: 411)

**sm̥Ho-* > Old Indic *sama-* "anyone, every", pl. *same* "all", Avestan *hama-* "jeder beliebige", Khotanese *hama-* "all", Middle Persian *hamāg* id., *hamē* "always" etc.

(Bailey 1979: 457; Beekes 1983: 202–03; in EWAI II: 703 Mayrhofer reconstructs **sm̥mo-*)

**smo-* > Old Indic *sma*, *smā* 'enclitic', more probably 'emphatic particle', orig. *"in the same way"; *smát* "together, jointly", in compounds also *smád-*; Avestan *maṯ* "together, with, always".

(EWAI II: 779; KEWA III: 547, 548; Hahn, *Language* 18[1942]: 94 compared it with Greek *μέτα*, Gothic *miþ* "with")

C. **per-/*pro-*

Indo-Iranian **pra-t(h)ama-* > Old Indic *prathamá-* "id., vordester, frühester", Pali *paṭhama-*, Prakrit *paḍhama-*, *puḍhuma-* (**pr̥thama-*), Sinhalese *paḷamu*, Shina *pumű-ko* and Iranian **parθama-* > Zoroastrian Pahlavi *pahlom* "id., better, excellent", Parthian *Parthama-* (in personal names) besides Avestan *fratəma-*, Old Persian *fratama-* "vordester".

In the suffix **-t(h)ama-*, Emmerick (1992b: 318) sees a contamination of two forms for "first": **pratha-* (with **-tha-* as in *caturthá-*, *pañcathá-*, *ṣaṣṭhá-* etc. "4th", "5th", "6th") x **prama-* (cf. Umbrian *promom*). Mayrhofer (EWAI I: 179) prefers to see here a contamination of the ordinal suffix **-tha-* and superlative in **-tama-*. A parallel formation **partāka-* continues in Khotanese *paḍāa-* "1st", Zoroastrian Pahlavi *fradāg*, Modern Persian *fardā* "early, next morning".

Iranian **parwiya-* > Gatha-Avestan *paouruiia-*, Younger Avesta *paoiriia-*, Old Persian adv. *prʰuvʲiyt*, a derivative of **parwa-* > Avestan *pauruua-* "prior", Buddhistic Sogdian *prw'yčk* "former", Khotanese *pīrūya* "former" (but *pīrma-* "first" resembles suggestively Lithuanian *pìrmas* id.) besides Old Indic *pū́rva-* "prior".

(Bailey 1979: 240; Bartholomae 1907–08: 95–116; Berger 1986: 58; Emmerick 1992a:178–79 and 1992b: 318–19; EWAI I: 157, 179)

Anatolian:

A. **oy-*

? **oy-g̥ki* > **ayanki* > Hittite **1**-*an-ki* = *a-an-ki* (KUB IV 2 IV 36, 38) "once" (Eichner 1992: 42–46; the reconstruction of the multiplicative suffix is

based on an exact parallel in Greek – see Benveniste 1962: 70; cf. e.g. Cretan *ἁμάκις* "once"). Unaccepted remains the attempt of Shevoroshkin (1979: 178) deriving Lycian B (= Milyan) *uni* translated "this only..." (Melchert 1993: 127 does not translate this word at all) and Hittite *un(i)* "that one" from **oyn°* (Melchert 1994: 187 admits a development from **óm*).

B. **sem-/*sm̥-*

**sm̥-yo-* (?) > Hittite *sani-* "one and the same, a single one" attested e.g. in *ša-ni-ia ú-it-ti* "in the same year" or "in the first year", *ša-ni-ya ši-wa-at-t[i]* "on one and the same day", *ša-ni-ya pí-di* "at one and the same place" (Eichner 1992: 45). Hittite *āšma* "firstly, on the first occasion" (always written *a-aš-ma*) also probably belongs here; following Neu, Eichner 1992: 43–44 derives it from **ō-smō*, lit. "at the one", comparing the preposition with Vedic *ā́* "to, around". The form **sem* or **som* can be also found in adverbs such as *kissan* "thus, in the following way", *kenissan* "thus, in this way", *enissan* "thus, in the manner mentioned", *apenissan* "thus, in that way", *annisan* "formerly", *kussan* "when?" (Eichner 1992: 46). On the other hand, he rejects the relationship of the other forms proposed by Shevoroshkin (1979: 177), namely *sannapi sannapi* "each for itself, separate, scattered", *sannapili-* "empty, alone; not impregnated".

C. **per-/*pro-*

Shevoroshkin 1979: 179–82 has collected various derivatives of the root **per-/*pro-*, assuming that they mean "first". But his interpretations are not generally accepted: Luwian *pāriyanalla/i-* is really built like Hittite *duyanalli-* "officer of the **second** rank", but its meaning is "of the beyond" > "future" (Melchert 1993b: 169). There is another hypothetical cognate in the Anatolian titles: Hittite ^{LÚ}*parhuwala-* "a functionary having to do with garments", cf. KBo 21.82 iv 17: 1 ^{TÚG}BAR.SI ^{LÚ}*pár-ḫu-wa-la-aš pāi* "the *p.*-man supplies one turban (?)" and KBo 22.157:6–8: ^{LÚ}*pár-ḫu-u-wa-la-a*[*š*..] / $^{[(TÚG)]}$*iš-kalli*[*šša*r...] / [(and)] *a pē*[*dai*] "the *p.*-man [...] brings in a torn garment [...]" (CHD 1995: 148). The title *parhuwala-* can be derived from **pr̥H$_{2/3}$wo-lo-*. But the semantic motivation connected with the meaning "first" ("the first valet" ?) cannot be proved. Lycian *przze/i-* does not mean "first", but "front-, foremost" (Melchert 1993a: 57). The Lycian B (= Milyan) examples quoted by Shevoroshkin, namely *pirli*, *predi*, *prijãmi/e*, *prijẽ*, *prijelije-*, *pruwa-*, remain untranslated (Melchert 1993a: 122–23). In Hittite and Luwian the ordinal "first" is derived from Anatolian **hant-* "forehead": Hittite *hantezzi(ya)-* "first, forward, front, first-born, earliest, foremost, first-rank", Luwian *hantili-* "first" (Puhvel 1991: 108–12; Eichner 1992: 92; Melchert 1993b: 52).

Armenian:

A. **oy-*

oy-no-* > Armenian *ēn* "God", lit. "the one", *so-in* "derselbe hier", *do-in* "derselbe da", *no-in* "derselbe dort", *andrēn* (andre-yn*) "ebendort", *astēn* (**aste-yn*) "ebenhier" (Pokorny 1959: 286)

B. **sem-/*sm̥-*

**smiH₂* "1" (f.) > Armenian *mi* "1" (Winter 1992c: 148 and Kortlandt 1994: 253; Meillet 1936: 99, 185 and Solta 1960: 454 reconstruct **smiyo-*); the unstressed variant *me-* appearing in *metasan* "11" and *mekin* "single", can be derived from **mea-* < **miya-* < **smiya-*. Similarly *mēn* "each one" reflects **miya-* + *-in*. The alternative form *min* "1" can be analyzed as **(i)m-in* < **sem-*, originally perhaps m.-n. stem (Winter 1992: 348). The suffix *-in* probably appears in *aṙaǰ-in* "1st". Kortlandt (1994: 253) presents an alternative solution, interpreting *min* as acc. of *mi*.

The synonymes *mu* and *ez* remain without convincing etymologies (Winter 1992c: 148). The interpretation of Pedersen (*IF* 39[1906]: 414) who proposed *ez* < **sem-ĝʰo-* and compared it with Greek (Cypriote) *ἴγγια · ἐΐς. Πάφιοι* (Hesychius) < **ἔν-για* (Solmsen, *KZ* 45[1913]: 333 finds the same suffix in Gothic adv. *ala-kjo* "all"), cannot be accepted without any explanation of the difference in aspiration.

**som-* > Armenian *omn* "some" (Meillet 1936: 90, 189; Strunk 1974: 380).

**sm̥HV-* > Armenian *amēn(-ayn)* "all" (Pokorny 1959: 903). Mann 1984–87: 1126 adds also *amol(k')* "pair", perhaps derivable from **sm̥H₂ol-*, cf. Latin *similis*, Old Irish *samail* < **sm̥H₂eli-* "equal, even" (see below).

C. **per-/*pro-*

Armenian *aṙaǰ-in* "1st" is evidently related to *aṙaǰ* "before" which is derived from **pr̥H-* (Winter 1992: 354). The origin of the suffix *-in* was sought in the analogical formation *verǰin* "last" vs. *verǰ* "end" (Brugmann 1892: 467; Kortlandt 1994: 253). Meillet 1936: 76 derived it from **-īno-*. The origin of *-ǰ-* remains open. Winter 1992: 354 speculated about its locative origin. Hamp 1972: 470–72 proposed another solution. He derives the pair *aṙaǰ* : *aṙaǰin* from the heteroclitic paradigm **pr̥H₃-wr-iH₂ /-wen-* > **parwarya- /-wen-* > **(p)argʷarya /-gʷin-* > **arragʷya / *arragʷin*, supporting the development of **-wy-* by analogy with *oł̇ǰ* "entire", reflecting more probably **solwyo-* than **solyo-*. The form **pr̥Hwo-* continues in Armenian *haraw* "south"; cf. Avestan *pouruua-*, *pauruua-* "primary, frontal south" (Djahukian, *Annual of Armenian Linguistics* 11[1990]: §5).

Phrygian:

In Phrygian the numeral "one" can be identified in *ἴαμβος* "Kulttanz für Dionysos", lit. "Einschritt", cf. *θρίαμβος & διθύραμβος* "Drei-, Vierschritt". The first component **ἰ(α)-* corresponds to Greek Lesbian, Thessalian *ἴα* f. "ein und dieselbe/derselbe" (Haas 1966: 702). Beekes 1995: 212 derives it from **siH₂* corresponding to the feminine personal pronoun e.g. in Old Irish *sí*, Gothic *si* etc. (Brugmann 1911: 390). More probable seems to be the traditional point of view, connecting *ἴα* with the anaphorical pronoun or the root of the numeral "1" **oy-*. This solution can be supported by Cretan *ἴττον· ἕν*

(Hesychius), remodelled after *διττός, τριττός* from **i(o)-* (Schwyzer 1939: 588 with older literature).

Greek:

A. **oy-*

**oy-no-/-ā* > Greek m. *οἰνός* (Poll.), f. *οἴνη* (Achae., Zen.) "one (on a die)"; cf. also *οἰνίζειν · τὸ μονάζειν κατὰ γλῶσσαν* and *οἰνῶντα · μονήρη* (Hesychius);

**oy-wo-* > Greek *οἶος* (Hom., Hsd.), dat. *οἶϝωι* (Cypr.) "alone", further *οἰέτης* (Hom.) "eines Alters" < **οἰϝο-ϝετης* and probably Mycenaean *o-wo-we* = *οἰϝώϝης* "with a single handle".

(Brugmann 1892: 465; Frisk II: 364, 367; Schwyzer 1939: 588; Waanders 1992: 370)

B. **sem-/*sm̥-*

sem-s* nom. m., **sem* nom. n., **semeí* dat. m.-n. "1" > Greek m. **ἕνς* > Attic-Ionian *εἷς*, Doric *ἧς*, Gortynian *εν δικαδδετω̃* (ενς δ-*), n. *ἕν*, dat. *ἑνί*, but Mycenaean *e-me* = *ἑμεί*

**smiH₂* nom. f. "1" > Greek *μία*.

**sēmi-* "half" > Greek *ἡμι-* "half-" in compounds.

**somHo-* > Greek *ὁμός* "equal; one and the same" (the reconstruction of the laryngeal after Indo-Iranian data – see EWAI II: 703). The same root vowel appears in *ὁμαλός* "equal", but the Latin and Old Irish parallel formations are derivable from **sm̥H₂el-*; that is why Beekes 1983: 228 proposed that the original form was **ὁαμαλός*, influenced by *ὁμός*.

sm̥-* in **sm̥Ho-* > Greek *ἁμο-θεν* "irgendwoher"; **sm̥-* (in compounds) > *ἀ-, ἀ-*: *ἅπαξ* "once", *ἁπλοῦς* "single, simple", *ἄτερος* (Doric, Aeolic; Mycenaean *a₂-te-ro*), *ἕτερος* (Ionian-Attic) "one" or "the other (of two)"; *ἀδελφός* "brother", lit. "of the same wamb, couterus" with the change *ἀ* > *ἀ* caused by the Grassmann's law. The same prefix develops in a different way in compounds with initial laryngeals; so *μῶνυξ* "with a single (= uncloven) hoof" is derivable from **sm̥-H₃nogʰ-* (Beekes 1971: 140). It is tempting to speculate about an analogical formation in Armenian *ełungn* "fingernail, claw, nail, hook", if it reflects **en-ong-* + *-n* (cf. *ot-n* "foot", *ak-n* "eye" etc. – see Beekes 1969: 47) < **sem-H₃ongʰ-*. Indo-European **ĕ* has been preserved in Armenian, but before nasal **ĕ* gives *i* (Meillet 1936: 41). A passable solution could consist in the assumptiom that the dissimilation **n...n* > *l...n* preceded the change **ĕN* > *iN*. Finally, Hittite *sanku(wa)i-* "fingernail" with a puzzling *s-*, can represent the same compound. In the case of "*s*-mobile" ([s+*]*H₃ongʰu̯*° after Eichner 1985: 165) one would expect Hittite **ishanku*° (Beekes 1969: 47). The idea of assibilation of the expected laryngeal (so Josephson 1979: 100–01) appears to be quite unconvincing. On the other hand, the compound **sm̥-* & **H₃e/ongʰ-u-* would give Anatolian **sanhangu*° or **sananku*° (accepting the loss of all laryngeals before **o* in Anatolian – see Beekes 1988: 80–81) and further via haplology Hittite *sanku*°.

(Chantraine 326–27; Frisk I: 471–72; Schwyzer 1939: 588; Waanders 1992: 369–70)

C. **per-/*pro-*

The ordinal "1st" is represented by two variants in Greek dialects:

(a) Attic-Ionic, Arcado-Cypriotic, Lesbian *πρῶτος*, cf. also Mycenaean personal names *Po-ro-to* = *Πρῶτος* (?) and *Po-ro-te-u* = *Πρωτεύς* (?);

(b) Northwest Greek, Doric, Boeothian *πρᾶτος*.

Their origin is not sufficiently explained. Not all scholars accept even their compatibility.

So Schwyzer 1939: 595 discussed the reconstruction **πρόατος* < **πρώϝατος* (Brugmann 1892: 466) indicating the original form **πρωϝος* comparable with Old Indic *pū́rva-*, while for Doric etc. *πρᾶτος* he preferred **pr̥̄to-* < **pr̥Hto-*. Rejecting the hypothetical protoform **πρόᾱτος* because it would give *ω* in Doric, Beekes 1969: 215 reconstructed **πραϝο-τος*, in which **πρᾱϝο-* would correspond to Old Indic *pūrvá-* (cf. also Lejeune 1972: 264, fn. 2 and Szemerényi 1996: 228). This solution implies the laryngeal reconstruction **pr̥H₂wo-* (cf. Beekes 1995: 214). Alternativelly, Beekes 1969: 215 admits the metathesis of length in Doric: **προᾱτος* < **πρωατος* , justifying the reconstruction **πρωϝο* "< **pr̥H₃wo-*. Hamp 1972: 471 finds a support for the originality of **pr̥H₃wo-* in Greek in its probable derivatives *πρῶρα* "prow, the foremost part of a ship" and *πρών* "jutting rock" (i.e. "forward projecting"), deriving them from **πρώϝαρια-* & **πρώϝον-*. It is evident that this pair forms an ancient heteroclitic paradigm (with its feminine counterpart member) **pr̥H₃-wr-iH₂* vs. **pr̥H₃-won-* (cf. Armenian counterparts). Finally Waanders 1992: 378 reconstructs **proH₁-to-* "1st" (m.) > *πρῶτος* and **preH₂(e)H₁-to-* "1st" (f.) > *πρᾶτος*, interpreting the **H₁* -extension as an instrumental, hence **"by the frontside". Confronting the presented opinions with external evidence, the solutions leading to the starting point **pr̥H₁/₂wo-* also seem to be most hopeful for Greek.

Albanian:

A. **oy-*

**eni-* & **oy-no-* "that one" > proto-Albanian **(V)ni-ain-* > **ni-ēn* > common Albanian **nâ(nV)* > Geg *njân-i*, Tosk *njër-i* "(the) one" (cf. Geg *tân(ë)*, Tosk *tërë* "all" < **tod oynoN*, lit. "the single") besides Geg *njâ* and Tosk *një* "1". The North Geg indefinite article *nji* can be derived diretly from **eni-*, a proclitic postulated on the basis of Greek *ἔνιοι* "some", *ἔνη* "the day after next", Old Latin *enim* "fürwahr", later "denn, nämlich" etc. (Pokorny 1959: 320), cf. also Messapic *ennan* "illam" < **enɨ̄m* (Haas 1962: 95, 177; cf. Hamp 1966: 113).

(Hamp 1973: 2–6 and 1992: 903–04)

(B. **sem-*)

Huld 1984a: 101 tries to prove the origin of *një*, *nji* in the feminine **njā* < **(s)mjā* < **sm-i(e)H₂*, assuming the change **mɨ* > *nj*. (Hamp 1992: 903 re-

jects it, quoting a counter-argument in *qime* "single strand of hair" < *-*miā*, def. *qimja*). Huld 1984b: 60, 65 finds support for his point of view in the Greek and Armenian counterparts to *njëzet* "20" = "1 x 20", namely (East) Greek **ἑ-ϝῐκοσι* < **se-wī-ḱm̥ti* and Armenian *k'san* < **[sem]s-wī-ḱm̥t-* "1 x 20".

C. **per-/*pro-*

**pr̥H-wo-* "1st" > Albanian *(i) parë* (Hamp 1992: 904 identified **H* = **H*$_3$, cf. also Huld 1984: 150).

Italic:

A. **oy-*

**oy-no-* "1" > Old Latin **oinos* (acc. sg. *oino CIL I*^{2} 29, *oenos* Cic. *leg.* 3,3,9 etc.), Latin *ūnus*, Umbrian *unu* "unum".

(Coleman 1992: 389–90; EM 1084–85; WH 321–23)

B. **sem-/*sm̥-*

sm̥-* in Latin *simplus*, *simplex* "single", *semper* "always" (cf. *parum-per*, *paulīs-per*), *singulus* "solitary" (simplified from **singnulus* or dissimilated from **singno-* *"born together", cf. *bignae* "twins" – see Coleman 1992: 419), *semel* "once", *similis* "similar, equal" (semali-* < **sm̥H$_2$eli-* – see Beekes 1983: 228 who sees in **-el-* the same, probably adjectival formation, as in Hittite *sel*, the genitive of the anaphora), *semol* (*CIL* I 1531), *simul* "at the same time" (usually compared with isolated Gothic *simle* "once upon a time"; instead of the traditional view seeking a counterpart of Gothic *mél* "time" in the second part – see Wackernagel, *KZ* 30[1890]: 316; Coleman 1992: 415–16, 440, fns. 84, 85, 86 prefered a compound of **sem-/*sm̥-* and the verbal root **H$_1$el-* "to go", continuing in Greek *ἐλθεῖν*, Latin *ex-il-ium* etc.), cf. further Umbrian *sumel* "at the same time".

**smiH$_2$* > **(s)mī-* in **(s)mī-ĝ^{h}eslī* "belonging to one thousand" > early Latin **mīhēli* > **mīhīle* > *mīlle* "1000" (Rix 1991: 226).

**sēmi-* "half" > Latin *sēmi-* in compounds, *sēmō* "demigod" (Mann 1984–87: 1126).

C. **per-/*pri-/*pr-*

**pri-yos-* > Latin *prior* "first of two" and

**pri-is-mo-* > Paelignian nom. sg. f. *prismu*, Latin *prīmus* "first" represent the root **pri* (Latin adv. *prĭ* "before"), extended by comparative and superlative suffixes respectively.

**prei-wo-* > Umbrian abl. pl. m. *prever* "one at a time", Latin *prīuus* "individual, peculiar".

**prō-mo-* > Umbrian adv. *prumum*, *promom* "primum".

(Coleman 1992: 408, 416, 419)

Celtic:

A. **oy-*

**oy-no-* "1" > Old Irish *oen*, *oin*; Welsh, Cornish, Breton *un* besides Old Irish *oenán*, Welsh, Breton *unan*, Cornish *onan* "alone" (Vendryes 1960: O

10–11). The innovation **oyno-m-eto-* "1st" > Old Irish *oínmad* appears only in combination with tens, cf. also Medieval Welsh *unuet ar dec* "11" (Hamp, *ZCP* 45[1992]: 85).

B. **sem-/*sm̥-*

**sm̥-* in **sm̥-ĝʰeslo-* "one thousand" > **san-gles-to-* > Hispano-Celtic (Botorrita) *śan-CiliśTara* "1000th" (Lambert 1994b: 372; Szemerényi 1994: 98); **sm̥-tero-* "one of two" > Old Welsh *hanther*, Cornish, Breton *hanter* "half" (de Bernardo Stempel 1987: 156);

**sm̥Ho-* "alone" (?) > Gaulish *Samo-* in personal names: *Samo*, *Samogenus*, *Samorix*, *Samotalus* etc. (Evans 1967: 252–53; Billy 1993: 131). The meaning "summer" proposed for the component *Samo-* by Schmidt (*ZCP* 26 [1957]: 264–65) does not appear to be probable in the light of the quoted compounds where *rix* means "king", *talus* "front".

**sm̥H-* > Old Irish *sam-* "together", *saim* "pair, couple, yoke" (Vendryes 1978: S 19–20)

Cf. also Old Irish *samail* "resemblance", Welsh *hafal* "like, equal", Old Breton *-hemel* (in personal names) < **samali-* < **sm̥H₂eli-* (Beekes 1983: 228 and 1988: 92).

**smyo-* in Celtic **kon-smi̯o-* > Old Irish *cummae* "equal, identical" (Vendryes 1987: C 288–89).

**sēmi-* "half" > Gaulish *semi-*, *simi-* (Billy 1993: 135, 137).

C. **per-/*pro-*

prei-mo-* "1st" > Gaulish **rēmo-* reconstructed on the basis of the tribal name *Rēmi* "les premiers". The same name also appears on coins, namely *REMO* and *REMOS* (Lambert 1994a: 34, 42, 183; cf. also Billy 1993: 124). Formally identical forms are attested in Welsh *rwyf* "prince, chief" and Middle Cornish *ruif* "king" while Old Irish adv. *riam* "formerly" reflects **preisamo-* (Vendryes 1974: R 26–27). The **prei-*derivative with the meaning "first" was replaced by the innovation **kentu-* attested in Gaulish (La Graufesenque) *kintux*[< **kintukso-* (Lambert 1994a: 131) or **kintusko-* (Vendryes 1987: C 83), cf. Breton comp. *kentoc'h* "formerly", and further in personal names *Cintugnatos*, *-us* (= "Primigenitus"), *Cintusmos* (superl. **kintusamo-*) etc., similarly Welsh *cyntaf*, Middle Breton *quentaff* "the first", and Old Irish *cétnae* id. (kentonyos*). A promising cognate could be found in Thracian **kentho-*, naturally if its meaning was "first" (Polomé 1986: 185).

Germanic:

A. **oy-*

**oyno-* "1" > Germanic **aina* > Gothic *ains*; Old Icelandic *einn*, Old Swedish *ēn*, *en*, *æn*, *in*, Old Gutnic *ann*; Old High German *ein*, Dutch *een*, Old English *ān*, Old Frisian *ān*, *ēn*; cf. the derivative in **-ko-*: Gothic *ainaha* adj. "only", Old Icelandic *einga*, Old High German *einac*; cf. Balto-Fennic borrowings: Finnish *aino(v)a*, Karelian *ainuo*, Vot *ainago*, Estonian *ainua*, Livonian *âinagi*; Lule Lappish *aeina*, *-u* "alone". On the other hand, Gothic *ainakls*

"standing alone", Old Swedish *ænkill* "widower", Dutch, Low German *enkel* "simple, single", can represent a compound **oyno-ĝnH₁o-* with dissimilation *n...n* > *n...l* (cf. Gothic *niuklahs* = Greek *νεογνός* "see Rasmussen 1987: 218) assumed also for Latin *singulus* – see Coleman 1992: 440, fn. 88 following Leumann & Hofmann. The compound of **aina-* (in Gothic **aini-*) and **līƀan* "to remain" forms the numeral "11" (similarly "12"): Gothic dat. *ainlibim*; Old Icelandic *ellefu*; Old High German *einlif*; Old Saxon *elleƀan*, Middle Dutch *elleven*, Old Frisian *andlova*, *allewa*, *elleve* etc., Old English *endlefan*, Middle English *alleven* etc.

Crimean Gothic *ita* "1" is explained from **ainata*, n. of *ains*. Hamp assumed an 'emphatic' compound **ita-aina* "that one" (with following loss of *aina-*), cf. Slavic **ed-inъ* (see Lehmann 1986: 128).

(Lehmann 1986: 16–17; Ross & Berns 1992: 559–60, 593–96, 656)

B. **sem-/*sm̥-*

**sem-* > Germanic **sin-* (in compounds) > Gothic adj. f. *sinteina* "daily", *sinteino* "allways", Old Saxon *sin-nahti* "eternal night" etc. (Lehmann 1986: 305); extended in **sem(H)lom* > Gothic adv. *simle* "once, formerly"; Old High German *simblum*, *simble(s)*, Old Saxon *sim(b)la*, Old English *simbel*, *sible(s)* "always";

**sēmi-* "half" > Old High German *sāmi-*, Old English *sām-* in compounds;

**somH-ó-* > Gothic *sama* "the same one", in compounds e.g. *sama-leiko* "similarly", Old Icelandic *samr*, *sami*, Old High German *samo* "the same" etc. (Lehmann 1986: 294–95; the reconstruction of the laryngeal is based on the Indo-Iranian **samá-* "equal" where the absence of laryngeal would cause a lengthening in agreement with Brugmann's law – see EWAI II: 703).

**sm̥-t(e)ro-* > Gothic *sundro* adv. "alone, apart", Old Icelandic *sunder* "asunder", Old High German adv. *suntar* "separated from, apart, alone" etc.;

**sm̥Ho-* > Germanic **sum-* > Gothic *sums* "anyone", *suman* "once, formerly; in part", Old Icelandic *sumr* "some, any", Old High German, Old Saxon *sum* "some, any".

(Beekes 1983: 202–03; Lehmann 1986: 304; 328–29)

C. **per-/*pro-*

**pr̥H-* plus 'comparative' suffix **-mo-* (a), superlative suffix **-isto-* (b), their mixture (c): a) Germanic **furma-* > Gothic *fruma* (modified on the pattern of the suffix **-uma-*, cf. Szemerényi 1996: 228), Old Saxon *formo*, Old Frisian *forma*, *furma*, Old English *forma*; b) Germanic **furista-* > Old Icelandic *fyrstr*, Danish *forste*, Old High German, Old Saxon *furisto*, Old Frisian *ferist*, Old English *fyr(e)st*, Middle English *first*, *furst*, *frist*, *frust*, *frest*; c) Germanic **furmista-* > Gothic *frumists*, Old Frisian *formest*, Old English *fyrmest*, Middle English *furmest*. The extensions (a) and (b) also form the derivatives of Germanic **air* "early" (Gothic *air*, Old Icelandic *ár*) with the meaning "first": (a) Old English *ærra*, Middle English *e(a)rre* etc.; (b) Old High German *êristo*, Old Saxon *êrista*, Old Frisian *êr(e)st(a)*, Old English *ærest* etc.

Old English *forwost, forwest* "the first" can reflect **pr̥Hwo-* plus superlative suffix **-isto-* (Pokorny 1959: 815; Ross & Berns 1992: 624–25)

Baltic:

A. **oy-*

**oyno-* "1" > West Baltic **aina-* > Prussian m. *ains*, acc. *ainan*, f. *ainā*, Yatwingian *anf* (= *ains* ?) (Toporov 1975: 62–64; Zinkevičius 1984: 9);

**wV-oyno-* > East Baltic **veina-* > Lithuanian m. *vienas*, f. *vienà*; Lithuanian *ie* may reflect **ey/*ay/*oy*; the proof for the diphthong **-ey-* has been sought in the compound *vič-veĩnelis* "a single" (Trautmann 1923: 3). Hamp 1973: 4 tries to demonstrate the origin of Lithuanian *-ie-* in the contraction: **wV-'oyno-* > **v ' āina* > **v 'ẽna-*. Latvian m. *viêns*, f. *vienà* has to be based on the feminine **wV-'(o)ynā* > **v(V)in'ā* > **vẹ̃n'ā́*. The first component probably represents a zero- grade of the pronominal stem known from Old Church Slavonic *ovъ – ovъ* "ὃς μὲν – ὃς δέ", *ovi* "ἄλλοι", Old Polish *owo* "ecce" and Old Persian *ava-* "jener" (cf. Trautmann 1923: 20).

The nil grade in the root vocalism appears in Latvian *viņš* "he" (**vinr̥as*) with the same pronominal prefix, and without it in Lithuanian *ìnas* "true, real" (Trautmann 1923: 3).

Lithuanian *vienúolika* "11" represents the original form **[dešimtìs] vienúo liekúo* "[ten] with one extra", consisting of a sociative-instrumental of the numeral "1" and *liẽkas* "odd", changed subsequently to *vienúolika* under influence of the higher teens with *-lika* (Comrie 1992: 763–64).

In Lithuanian the same pattern is used for all teens, while a similar formation in Germanic is limited only to "11" and "12". It is remarkable that Old Lithuanian uses only *liekas* in the sense "11th". In the rare phrase *dešimtas liekas* the numeral "one/first" is also deleted (Hamp, *Baltistica* 8.1[1972]: 55–56).

C. **pr̥H-mo-* "1st" > Baltic **pīrma-* > Prussian m. *pirmas, pirmois*, f. *pirmoi*, Lithuanian m. *pìrmas*, f. *pirmóji*, Latvian *pĩrmais, pìrmaĩs*, dial. (East) *pyrms*.

(Comrie 1992: 729–30; Fraenkel 1962–65: 597–98; Trautmann 1923: 220)

Slavic:

A. **oy-*

There are two forms representing the continuants of **oyno-* in Slavic: (a) m.**edinъ & *edьnъ*, f. **edьna & *edьna* (and n. **edino & *edьno*) "one; single"; (b) **ino-* "one-" in compounds, **inъ* "other". These forms are attested as follows:

a) Old Church Slavonic m./f. *(j)edinъ/(j)edina* and *(j)edьnъ/(j)edьna*, Bulgarian *edín/edná*, Macedonian *eden/edna*, Serbo-Croatian *jèdan/jèdna*, Slovenian *éden/édna*, arch. *j-*, dial. *èn/éna*, Slovak, Czech, Polish *jeden/jedna*, Upper Sorbian *jedyn/jedna*, Lower Sorbian *jaden/jadna*, Polabian *jadån/janə̆* (loc.), Slovincian *jə̆dĕn*, Old Russian *odinъ/odina*, Russian, *odín/odná*, Ukrainian

odýn/odná, Byelorussian *adzín/adná* (Blažek, Peňáz & Erhart, ESJS 5: 276–77; Trubačev 1979: 11–12)

b) Old Church Slavonic derivatives: *inokъ* "solitary; monk", *inogъ* "wild boar" (cf. French *sanglier* id.), later "gryph" (sometimes derived via haplology from **ino-nogъ* "one-footed"), adv. *inako* "otherwise" etc., besides numerous compounds: adv. *vъ inǫ* "semper", *inočędъ* "μονογενής", *inomyslьnъ* "μονότροπος", *inorogъ* "μονόκερος" etc., besides *inojęzyčьnikъ* "ἑτερόγλοσσος", *inoplemenьnikъ* "ἀλλόφυλλος" etc., and further *inъ* "some; other", Bulgarian *in*, Serbo-Croatian *ȉn, ȋni*, Slovak *iný*, Czech *jiný*, Upper Sorbian *hiny, jiny*, Lower Sorbian *hyny* (arch.), Slovincian *jini*, Old Polish *iny*, Polish *inny*, Byelorussian *inšy*, dial. *ínny*, Ukrainian *inšyj*, dial. *ýn(n)yj*, Russian *inój*, dial. *ín(n)yj* "other" (Havlová & Valčáková, ESJS 4: 244–45).

There are more etymological interpretations of these two words. The older etymologies – see the discussion in ESJS. The following ideas have not yet penetrated in the etymological dictionaties. So Hamp 1973: 4 opined that the *i*- and *ь*-forms reflect the old distinction between m. and f.., namely m. **(j)ed-inъ* vs. f. **(j)ed-ьná* < **-eyno-* vs. **-inā́*. He offers a tempting solution based on the influence of the *e/∅* vocalism of m. **sem-/f.* **smiH₂* (unattested in Slavic). But he does not explain the *e*-diphthong in **ino-* "μονο-" and **inъ* "other; some". A key to the solution should be sought in the reconstruction **ēyno-*, supported by the intonation in Serbo-Croatian *ȉn* (Trautmann 1923: 3). The long diphthong can reflect **e* + **oy* where **e* probably represents the same deictic particle as **e* in Greek *ἐκεῖνος* "that", Oscan *eco* "hic", Russian *étot* "this" : *tot* "that" etc. (Pokorny 1959: 283).

A deictic/emphatic function was probably also characteristic for the particle **ed-* appearing in the form (a): Old Church Slavonic *(j)ed(ъ)va* "scarcerly, hardly" (*-va* corresponds to Lithuanian *võs* id.), Latin *ecce* "behold" (**ed-ke* ?), *ecquis* "some, any", Siculish [*e*]*d* (Pisani, *IF* 48[1930]: 238), Oscan *ekkum* "idem", Hittite dat.-loc. *edi* "ei", abl. *ediz* "ab eo", dat. pl. *etas* "eis", Lydian *eds* "this" (Pokorny 1959: 284; Tischler 1983: 118). The preceding thoughts imply the internal structure (a) **ed-e-oyno-* "just/only this one" (cf. van Wijk, *IF* 30 [1912]: 383; Gonda 1953: 51) and (b) **e-oyno-* "this one" (a similar idea was already proposed by Osten-Sacken, *IF* 33[1913–14]: 271 who assumed Slavic **e-ьnъ* < **e-ino-*).

B. **sem-*

**sōm(H)o-* "self, alone, single" > Slavic m. **samъ* (f. *-a*, n. *-o*) > Old Church Slavonic *samъ*, Bulgarian, Macedonian *sam*, Serbo-Croatian, Slovenian *sâm*, Slovak, Czech *sám*, Upper & Lower Sorbian, Polish, Byelorussian, Ukrainian, Russian *sam*.

(Vaillant 1958: 471–73)

C. **per-/*pro-*

**pr̥H-wo-* "1st" > Slavic **pьrvъ(jь)* > Old Church Slavonic *prьvъ*, *prьvyi*, Bulgarian *prъv*, *pъrvi*, Macedonian *prvi*, Serbo-Croatian *pr̃vī*, Slovenian *pr̃vi*, Slovak, Czech *prvý*, Upper Sorbian *pjerwy*, Lower Sorbian *pérwy*, Polabian

pår[w]y, Old Polish *pierwy*, Old Russian *пьрвъ*, Ukrainian, Russian *pérvyj*. There are also extended forms **пьрвьšьjь* > Slovak dial. *pryšy* (Gemer), *prušší* (Liptov), *pirši* (Bardejov), Slovincian *pjl̨ərši*, Modern Polish *pierwszy*, Ukrainian *péršyj* and **пьрvjьnjь* > Bulgarian and Macedonian dial. *пръвńи*, Old and Modern Czech *první*. Both the forms represent comparatives (Illič-Svityč 1963: 81–84).

(Comrie 1992: 729–30; Vaillant 1958: 652–53)

Tocharian:

B. **sem-/*sɪm̨-*

The most relevant forms of the numeral "1" in Tocharian are as follows:

	m.		f.	
	A	B	A	B
nom. sg.	*sas* (*sas-ak* "alone")	(*ṣes-ke* "alone")	*säṃ*	*sana/somo*
	ṣa- in *śäk ṣapi* "11"	*ṣe*		
obl. sg.	*ṣom*	*ṣeme*	*ṣom*	*sanai/somo*
nom. pl.	*ṣome*	*ṣemi*	*ṣomaṃ*	*somona*

Cf. also A *sam*, B *säm* "equal, like", A *ṣoma-pācär* "having one [and the same] father" etc.

There are more detailed analyses studying the Tocharian numeral "1" which have appeared recently (Hamp 1971; Van Windekens 1976: 415–16; Hilmarsson 1984 = 1986: 77–93; Pinault 1989: 60; Winter 1992: 98–103).

At least in the case of some forms they are in agreement:

**sēm-s* (Hamp, Hilmarsson; also **sēm-(s)* after Adams 1988: 122) or **sem-s* (Winter) "1" nom. sg. m. > A *sas* "1", *sas-ak*, B *ṣes-ke* "alone". The reconstruction **som-s* (Van Windekens) is probably wrong.

**smiH₂* (Hamp, Pinault) = **sɪm̨yA* (Winter) = **smiɟə* (Hilmarsson) "1" nom. sg. f. > **sämyā* > Common Tocharian **sänā* > A *säṃ*, B *sana*. The reconstruction **s̨mā* (Van Windekens) does not explain the change **m* > **n* and it is also without any external support.

**sem* (Winter) = **sēm* (Hilmarsson) "1" nom. sg. n. > B *ṣe* "1", A *ṣa-* in *śäk ṣapi* "11". The following teens *śäk wepi* "12" and *śäk täryāpi* "13", contain nonmasculine forms of "2" and "3". Winter 1992: 99 concludes: "...it is reasonable to assume that A *ṣa-* is a reflex of the old neuter nom.-acc. PIE **sem*"; the generalization of the neuter in B *ṣe* has an analogy in B *wi* "2".

Hamp (1971: 440) and Winter (1992: 100) derive other cases including plural from **sēm(o)-*. Winter sees here an intra-Tocharian development, Hamp assumes an influence of the nom. **sēms*. On the other hand, Hilmarsson 1986: 92 reconstructs acc. (> obl.) sg. m. **semɪm̨*. Accepting the same starting point, Adams 1988: 122 proposes a rebuilding on the basis of a thematic derivative

to **som(H)om*. A *sam*, B *sām* "like, equal" can be derived from **somHo-*, but they do not correspond mutually. West Tocharian should have preserved the thematic vowel; hence B *sām* could be a borrowing from A *sam* (so Van Windekens 1976: 415 who reconstructs A **sām* < **sōmo-*). Alternatively Hilmarsson admits even a borrowing from Sanskrit *samá-* "like".

C. **per-/*pro-*

**pr̥H-wo-* "1st" > Tocharian B *pärweṣṣe* with adj. suffix *-eṣṣe* (= A *-aṣi*) < **-oskyo-*; further cf. adv. *parwe* "first, at first" and *yparwe* "first, firstly" < Common Tocharian **yän pärwæ* "at first" < **H₁en pr̥Hwom*. The corresponding form in East Tocharian is *pārwat* "first-born, elder" with a *t*-suffix common for ordinals, cf. *wät* "2nd" etc.

(Hilmarsson 1991: 189; Van Windekens 1976: 366 and 1979: 135; Winter 1992: 132)

§2. Reconstruction:

A. The most widespread Indo-European numeral "1" is formed by the root **oy-* plus one of the following three suffixes: a) **-k$^{(w)}$o-* (Indo-Aryan), b) **-wo-* (Indo-Iranian, Greek), c) **-no-* (? Anatolian, Armenian, Greek, Albanian, Italic, Celtic, Germanic, Baltic, Slavic). The original functions of these suffixes can be determined on the basis of the following examples: a) Old Indic *dvika-* "consisting of two", *māmaka-*, *tāvaka-* "my", "thy", Old High German *sweiga* "wealth" < **swoy-ko-* "proper" besides Gothic *ainaha* adj. "only", Old Church Slavonic *inokъ* "solus" etc. > (Brugmann 1906: 482, 493); b) **sol-wo-* "whole, total", **wi̯k-wo-* "every, all" etc. (Brugmann 1906: 202); c) **al-no-* > Oscan *allo* "entire", Gothic *alls* "all, every, whole", cf. also Gaulish (Coligny) *ci-allos*, (La Graufesenque) *ci-alli* "the other" (Hirunuma 1988: 40–41; Lambert 1994: 114–15), **sol-no-* > Old Latin *sollus*, Oscan *sullus* "omnes", Welsh *holl* "whole, all", **pl̥H₂-no-* "full" etc. (Brugmann 1906: 257). In Albanian, Baltic and Slavic (plus Crimean Gothic ?) various deictic prefixes precede the stem **oyno-*.

In laryngealistic reconstruction the root **oy-* = **Hoy-*. Regarding the neutralization of all laryngeals before **o* (Beekes 1972: 117–31), the determination of the 'color' of the laryngeal remains open.

In opposition to **sem-* which has to express "togetherness, inclusion", the original meaning of **oy-* has been determined as "separateness, isolation" (Coleman 1992: 389).

B. Three genders **sems* m., **smiH₂/*sm̥my̯ə₂* f., **sem* n. are fully reconstructible only in Greek and Tocharian; the relics in other branches confirm their at least late Indo-European age. In **sems* Szemerényi 1996: 222 sees an innovation for older **sēm*. Beekes 1983: 225 and 1995: 190 reconstructs the whole paradigm: nom. **sṓm(s)*, acc. *sém-m̥* or **sóm-m̥*, gen. **séms* or **sm-ós*, dat. **sm-éy*, loc. **sḗmi*, but his example having to support the form **sṓm*, namely Slavic **samъ* "alone, self", reflects *o*-stem **sōmo-* and represents doubtless a later formation. The lengthening is typical for the whole class of

Slavic adjectives, e.g. **malъ* "small", **nagъ* "naked", **slabъ* "weak" etc. (Machek 1956: 34 and 1971: 11 assumes an expressive lengthening, but it looks like a regular process of the type Lex Brugmann). Other reconstructible derivatives: **sm̥-* "one-" in compounds, also **sm̥-tero-* "half" = "one of two", **sēmi-* "half", originally probably locative of "one" (Beekes 1995: 190), hence "in one [of two]", **somHo-* "equal, the same", **sm̥Ho-* "anyone", and others.

C. Besides evident comparatives or superlatives ("first" = "former" or "foremost" – see Cowgill 1970: 123) or innovations (Hittite *hantezzi-*; Celtic **kintu-*), there was probably the only form inherited from the proto-language, namely **pr̥H-wo-*. The laryngeal was $*H_2$ or $*H_3$, depending on the interpretation of Greek data.

§3. Etymology:

A. The root **oy-* (**Hoy-*) has been etymologized in various ways:

a) The most popular solution identifies the root **oy-* with Indo-European anaphora (Pokorny 1959: 280–86; Sihler 1973: 111; Schmid 1989: 10; Hamp 1992: 904; Lehmann 1993: 254). There are various attempts to reconstruct the paradigm of the anaphoric pronoun. Let us confront the most recent reconstructions of the nominative according to the following scholars: Szemerényi 1996: 207; Kortlandt apud Beekes 1983: 209; Beekes 1995: 205; Hamp 1986: 398.

	sg.			pl.		
	m.	f.	n.	m.	f.	n.
Szemerényi	**is*	**ī*	**id*	**eyes*	**iyās*	**ī*
Kortlandt	**e*	**ī*	**id*	**ei*	**ās*	**ā*
Beekes	$*H_1e$	$*iH_2$	**id*	$*H_1ei$	$*iH_2es$	$*iH_2$
Hamp	**ei*	$*i\text{-}eH_2$	**id*	**ei-es*		$*i\text{-}H_2$

In agreement with Hamp Mayrhofer (EWAI I: 103) reconstructed m. sg. $*[H_1]ei$, f. sg. $*[H_1]iH_2$, n. sg. $*[H_1]i\text{-}d$. It seems that the reconstruction $*H_1ey$ conforms to the facts better than the others. The *e*-vocalization also implies the initial laryngeal $*H_1$ for the numeral "1" ($*H_1oy$-), naturally if they are related. And just it is not quite sure. The root of the numeral "1" is represented by the diphthong **oy*, while in the paradigm of the anaphora, there is none of forms with **o*. Naturally, the ablaut *ey* : *oy* is regular, but if the *oy*-forms do not appear in the paradigm of the anaphorical pronoun, the structural mechanism of this change is unclear.

Erhart 1982: 139 and p.c. (1997) proposes a tempting idea assuming for **(H)oy-* (**H₃AI* in his reconstruction, cf. Hamp 1973: 3 reconstructing $*H_3ei$- = $*H_3ey$-) an original meaning "one of two". This idea also allows to reinterpret the numeral "2". Erhart speculated about **dV-H₃AI* "1x2". I prefer the following solution: obl. **dwoy-* < **du* + $(H_1)oy$ "two" x "one of two", hence *"the second of two" or sim. The nom. du. **d(u)wō(u)* could originate via a contraction from $*duwoyH_1u$ where the final **-u* was named 'dual collective'

by Adams 1991: 20. Georgiev (*IF* 78[1973]: 48) also tried to eliminate the discrepancy between the nom. du. m. in **-ōu* vs. nom.-acc. du. n. in **-oiH₁*, assuming the development **-ōu* < **-ow?* < **-oi?* (*? = H₁*) under the influence of the gen.-loc. in **-ow(s)* and the nom. pl. m. in **-ōs* < **-o-es*.

b) Carruba 1979: 199 assumes a pronominal base **o-* plus deictic **-i-*, finding the same **-i-* in the following numerals **du-i-* "2", **tr-i-* "3". This etymology is unconvincing. The evidence for the pronominal base **o-* is rather doubtful (Pokorny 1959: 280). The idea of the common origin of the **-i-* is also more than problematic. So Villar 1991: 136–38 opines that the **-i-* in "2" and "3" represents a pronominal plural. It automatically excludes the same interpretation for "1". On the other hand, the forms **dwi- & *tri-* are typical for compounds, but they are hardly primary.

c) The comparison of Indo-Aryan **aḭka-* and Latin *aequus* "even, level", also *aiquos*, *aequos* etc. (EM 16) was proposed already by Bopp (1829) and others (e.g. Brugmann 1892: 466 and 1911: 332, fn. 1). It implies the suffix **-kʷo-*, perhaps identical to **-(H₃)kʷo-* with an individualizing function (cf. Hamp, *BSLP* 68[1973]: 77–92). The correspondence of **oy-* expected in Indo-Aryan in agreement with the vocalization in other Indo-European branches and **ay-* in Latin (cf. also *aemulus* "rival") is thinkable only in case of the ablaut **H₂oy-* vs. **H₂ey-*. Such a laryngeal excludes any relation with the anaphora proposed in a).

d) The neglected idea of Holmer (1966: 23–25), connecting **oy-* "1" with "egg", is unconvincing not only semantically, but also phonetically, cf. the recent detailed analyses of Schindler, *Sprache* 15[1969]: 144–67 (**ō-ḫuḭ-óm* "egg" = *"das beim Vogel Befindliche" vs nom. **ḫuóḭ-s*, gen. **ḫuḭ-és* "bird"; *ḫ = H₂*) and Rasmussen 1989: 72 (**o-h(a)uḭH₁-óm*).

B. The etymon in question is evidently related to the preverb/preposition **sem/*som/*sm̥* "together" > Old Indic *sam°/sa°*, Avestan *hąm* "together", Khotanese *haṃ-jsam-* "to assemble", Ossetic *æn-byrd* "assembly" etc. (EWAI II: 702, Bailey 1979: 446), Dakish *san-* in *Sanpaeus rivus* = Lithuanian lake *Samp̃e* (Duridanov 1969: 61), Messapic *sa-* (Haas 1962: 218), Lithuanian *saṁ-das*, *sam-dà* "hire, rent" (**som-dʰH₁-eH₂* *"Zusammenlegung", cf. Old Indic *sahá*, Avestan *hada* "together with" – see Rasmussen 1989: 218–19), Old Church Slavonic *sъ* "with", *sǫdъ* "lawcourt" etc. Regarding the secondary creation of prepositions/preverbs, the primary meaning was probably "one", perhaps in the sense "unity, togetherness" (Coleman 1992: 431, fn. 4; Szemerényi 1996: 222).

C. Brugmann (1906: 206) opines that the suffix **-wo-* forming **pr̥H-wo-*, extends an original adverb. It should be identified in the prepositions **pr̥H₂ós* "before" (originally gen.) > Old Indic *purás*, Greek *πάρος*, **preH₂i* "at the front" (originally loc.) > Oscan *prai*, Latin *prae*, Gaulish *are-*, Old Irish *air* (the Celtic innovation **pr̥H₂-i* remodelled after **pr̥H₂-os* – see Hamp, *Eriu* 33 [1982]: 181), Old Church Slavonic *prě-dъ*, and **pr̥H₂-éH₁* (originally perhaps instr.) > Old Indic *purā́* "formerly", Gothic *faura* "in front (of)" (Beekes 1995:

221; Brugmann 1911: 880–87). The starting point could be sought in an unattested noun **preH₂* "front, face" or sim. (cf. the hysterodynamic paradigm reconstructed by Beekes 1995: 182) or **perH₂* id. (cf. the proterodynamic paradigm reconstructed by Hamp, *IF* 93[1979]: 1–7). Alternatively, Demiraj 1997: 159–60 proposes a thematization of the 'weak case' **pr̥H-u-*, hence a *u*-stem in the zero-grade typical for adjectives (but one would expect the *e*-vowel in thematized form, i.e. **pr̥H-ú-* → **perHwo-*, see e.g. Hamp 1991: 117). In any case the etymology proposed above solves the question of the laryngeal: **H* = **H₂*. The same root, probably without the laryngeal extension, is attested in **pro* "before" (Beekes 1995: 221; Brugmann 1911: 873 and Pokorny 1959: 813 also reconstruct the variant **prō*).

§4. External parallels:

A. Møller 1909: 2 compared Latin *aiquos*, *aequus* "even, level" and *aemulus* "rival" with Geez *ʔayāy* "aequalis, par, socius", *ta-ʔayaya* "to be equal, comparable, paired". Leslau 1987: 51 adds *ʔayaya* "to be/make equal, even out", *ʔayāwi* and *ʔəyuy* "equal" etc. and further Tigre *ʔayaya* "relative, kinsman" and Syrian *ʔāwē* (*ʔ-w-y*) "agreeing, in concord". If the identification of **H₂* (> Latin *a-*) = ʕ and **H₁* = ʔ is correct (cf. Beekes 1995: 148) and if these sounds correspond to their Semitic (Afroasiatic) counterparts one-to-one, the regular Indo-European correspondent to the Semitic root **ʔ-w-y/*ʔ-y-y* is **H₁oy* .

Regardless of the determination of the laryngeal there are remarkable Uralic and Altaic parallels: Samoyedic **oj-/*ə̑j-* "1" (Helimski 1986: 136) /// Tungus: Oroch *ojoke* "some, one" (TMS II: 9) // Korean *oi*, *ö* "only, a single", *oi-nun-thoŋi* "one-eyed person" (Ramstedt 1982: 134) // ? proto-Japanese **uja* "the same" (Starostin) – see Blažek 1996–97: 3.

B. At first sight, the closest parallels appear in the Balto-Fennic languages: Finnish, Eston, Veps, Vod *sama*; Lappish (Norwegia) *sæmma*, (Inari) *sabma*, *samma* "the same". But their Germanic origin is generally accepted (Thomsen 1870: 169; SKES 959), cf. Gothic *sama* "the same one", Old Icelandic *samr*, *sami*, Old High German *samo* "the same" (Lehmann 1986: 294).

There are remarkable Altaic parallels: Old Turkic *sïŋar* "one of a pair" // Written Mongolian *sonduγai* "odd" // Manchu *sonio* "one, a single", *sonixon* "single, not in pairs", *son son i* "one by one, each for itself" // Middle Korean *hannăh* "one" with the numerative *nā* (in North Korean) meaning "piece, face". All the forms can be projected into proto-Altaic **soni̯V* (Blažek 1997: 62–63). Due to assimilation to the following velar (in Turkic) or dental (Mongolian, Korean), the protoform **som-* is also thinkable. Similarly in Manchu, the development *sonio* < **somio* is also admissible. The alternatively reconstructed proto-Altaic **somi̯V* "one (of pair); single" is fully compatible with Indo-European **sem-/*som-/*sɱ-*. It is legitimate to see in Altaic and

Indo-European numerals for "one" the forms inherited from a common proto-language (Nostratic).

C. If the identification $*H_2$ = ʕ is acceptable (and $*H_3$ = ʕʷ – see Beekes 1995: 148), the form $*p_{\acute{e}}rH_2$ – corresponds one-to-one to the Semitic root *p-r-ʕ: Ugaritic *prʕ* "first" (Segert 1984: 198; Gordon 1965: 471 also mentions the ordinal usage in *ym.prʕ* "the first day") or "chief; excellent, the best" (Aistleitner 1965: 261), Hebrew *peraʕ* "chief" (cf. German *Fürst*), Arabic *farʕ* "top (of branch)", *faraʕ* "the first foal of a camel or young of a sheep", *farʕiyy* "first-born, first" etc. The third radical probably does not belong to the root (similarly like the Indo-European $*H_2$), cf. Arabic *furr* "the best (of men, camels etc.)", *furrat* "the first part" besides *faraṭa* "he was first or foremost" (it was already Møller 1909: 110 who compared these Arabic examples with their Indo-European counterparts).

There are also remarkable parallels in Kartvelian: Georgian *pirw-el-* "first" (Klimov 1986:198), *pirmšo-* (**pir-m-šwe-*) "first-born" = Old Indic *pūrva-sú-* id. (Gamkrelidze & Ivanov 1984: 597, fn. 2, 878). They have been explained as borrowings from some unspecified Indo-European dialect (Klimov) or directly from the Indo-European proto-language (Gamkrelidze).

§5. Conclusion:

The analyzed forms denoting "one" and "first" can be reconstructed as $*H_1oy$ "one [of two]", **sem-* "one" = "unity, togetherness" and $*p_{\acute{e}}rH_2$-*wo-* "first" = "frontal". The promising external parallels confirm that the analyzed words belong to the most archaic part of the Indo-European lexicon.

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ESJS *Etymologický slovník jazyka staroslověnského* 1–7. Praha: Academia 1989–96.
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TMS *Sravnitel'nyj slovar' tunguso-mańčžurskix jazykov* I-II. Leningrad: Nauka 1975–77.

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INDO-EUROPEAN "two"

§1. The numeral "2" is well attested in all Indo-European branches. The most important forms of this numeral and its basic derivatives can be projected in the following partial reconstructions allowing their deeper analysis. For the first approximation the 'Brugmannian' reconstructions are used.

Indo-Iranian:

d(u)wṓ* "2" m. > Vedic nom.-acc. m. *dvā́ & duvā́*, besides *dváu & duváu* reflecting **d(u)wṓw* (*dv-* 9x, *duv-* 35x in RV, always after a long vowel or a consonant or initially in the line – see Emmerick 1992a: 165), instr.-dat.-abl. *d(u)vā́bhyām*, while gen.-loc. *d(u)váyoṣ* reflects the stem **d(u)woy-* + **-ous*; Prakrit *dō*, Hindi, Panjabi etc. *do*; Avestan nom. m. *duua*, cf. *duuā-čina* "irgend zwei", while oblique cases are derived from the stem **dwoi-*: gen. *duuaiiå* (-ōs*), dat. *duuaēibiia* (**-b^{h}yō*), Khotanese *d(u)va* m., Khwarezmian *(')δw(')* m., Manich., Buddh. Sogdian *(')δw'*, *'δw*, Yaghnobi *du*, Pashto *dwa*, Sanglechi *dōu* etc., Ossetic Digor *duw(w)æ* / Iron *dywwæ*, *duwæ*, Middle Parthian *dw*, Zoroastrian Pahlavi, Baluchi *dō*, Kurdic, Modern Persian *du* etc.; also in the compound **dwṓ-dḗḱm̥* "12" > Old Indic *dvā́daśa*, Avestan *duuadasa*, Sogdian *δw'ts*, Khotanese *dvāsu*, Khwarezmian *'δw's*, Pashto *d(w)ōlas*, Ossetic Digor *duwadæs* / Iron *dywwadäs*, Middle Persian (Turfan) *dw'zdh*, Zoroastrian Pahlavi *dwāzdah*, Modern Persian *davāzdah*.

d(u)way* "2" f. > Vedic nom.-acc. f. *dvé & duvé*, Nepali, Bengali, Assamese, Oriya *dui* besides Prakrit *bē*, Apabhramśa *bi* (db-*); Kati *d'u*, Waigali *dī̆*, Khowar *jū* etc. (**dyu-* < **dui*); Avestan acc. f. *duiie* (**duue*), Khotanese *dvī* f., Khwarezmian *'δwy* f.

**d(u)wóy* "2" n. > Vedic nom.-acc. n. *dvé & duvé*; Avestan nom. n. *duuaēča*, Khotanese *dvī* n.

**dwoy-ó-* or **dwoi-yó-* "double" > Old Indic *dvayá-*, Pali *dvaya-* (Beekes 1995: 216 reconstructs **dwoyHo-*).

**dwo-* is preserved only in **dwo-ko-* > Old Indic *dvaká-* "zu zweien".

dwi-* in derivatives as **dwi-s* "twice" > Old Indic *dvíṣ*, Avestan *biš* and **dwi-tī̆yo-* "2nd" > Old Indic *dvitī́ya-*; Old Persian *d'uv'itiy-*, Avestan (Gatha) *daibitiia-*, (Young) *bitiia-*, Buddh. Sogdian *δ(y)βty*, Zoroastrian Pahlavi *dudīgar*, Modern Persian *dīgar* (dvitī̆ya-* & **kara-* "time") besides **dwi-to-* > Tumshuq Saka *źidā(nā)*, Khotanese *śāta-*, Pashto *bəl*, Parthian *byd*, Zoroastrian Pahlavi *did* or compounds as Old Indic *dvi-pád-* "two-footeed", Sogdian *δyβp'δ'kw*, Khotanese *śivāa*, Middle Persian *dwp'y*, Modern Persian *do-pāye* etc., but Avestan *bi-zangra-* id.

? **du-* in **du-tiyo-* > Pali *dutiyam*, Prakrit *duio* "for the second time"; cf.

also Prakrit (Aśoka) *dupada-* "two-footed" (Gonda 1953: 45–46 is sceptical, quoting e.g. Prakrit *duhā* vs. Old Indic *dvidhā* "in two ways").

wīḱṃti-/*wīḱonti-* (?) > Indo-Iranian **vīćati-* &vīćanti-* (?) > **vīśati-* & **vinśati-* > Old Indic *viṁśatí-*, Pali *vīsati, vīsaṁ*, Prakrit *viṁsadi, vīsai, vīsā* etc., Gujarati, Marathi *vīs*, Hindi *bīs* etc.; Kati *vici*, Waigali, Ashkun *wišī*, Pashai *wəst* etc.; Avestan *vīsaiti* (the form *vīsata-* in *v⁰.gāiia-* "a length of twenty paces" is remodelled after *θrisata.gāiia-* "a length of thirty paces") and *vīsas* < *vīćants*, Khotanese *bistā*, Chr. Sogdian *wyst-(myq)*, Khwarezmian *'wsyc* (**ūsēc*), Wanetsi *šwī*, Pashto *wšəl*, Sanglechi *wišt*, Yidgha *wisto*, Ossetic Digor *insæy* / Iron *yssæ3* (cf. Scythian or Sarmatian name from Olbia *'Ινσαζαγος* = *Vicentius*; **vinś⁰* as in Old Indic ?), Parachi *γušt*, Ormuri *jīstu*, Parthian *wyst*, Zoroastrian Pahlavi *wīst*, Modern Persian *bīst*, dial. also *vīst(a), vissa*, Balochi *gīst* etc.; cf. Old Persian or Median**vīstaxva-ka* reconstructed according to Elamite *mi-iš-du-ma-kaš* 'the denotation of the silver coin representing $^{1}/_{20}$ Krša' = 'a half of a silver shekel' and **vīstaxvya-* = *mi-iš-du-ya* "$^{1}/_{20}$" (Hoffmann 1965: 300; Hinz & Koch 1987: 925–56; Henning 1965: 43, fn. 3 sees in **-n-* a substitution of **d* in **dḱṃti*).

(Abaev I: 385 and IV: 276–78; Bailey 1979: 162–63, 293, 399; Berger 1986: 27, 35; Debrunner & Wackernagel 1930: 341–43, 366–67; Emmerick 1992a: 165–66, and 1992b: 302, 305–06, 320; EWAI I: 762–63 and II: 550–51)

Anatolian:

duw(e/o)nt-* > Hieroglyphic Luwian nom.-acc. pl. *tuwa"zi* (Meriggi 1980: 283; in 1962: 136, 164, 1966: 59 and 1967: 128 Meriggi transcribed *'tu-wa-i*), cf. **II *tu-wa/i-zi* from the inscription Maraş IV (Meriggi 1967: 128 and tab. N⁰. 32), further **II**-*zi* and **II**-*zi-i* etc. (Meriggi 1967: 125 and 134 resp.). The *-nt-* extension is in full agreement with the hypothesis of Eichner who sees in Hittite **2**-*e* nom.-acc. pl. n. of the *-nt-*stem (1992: 47–50), hence ***2**-*ante*.

**du-yo-* (Puhvel 1978: 99) or **dwi-yo-* (Eichner 1992: 61) > Hittite or Luwian *duyanalli-* "officer of the second rank" (cf. Latin *secundānus* "second in rank"), consisting of the ordinal suffix *-ana-* and the derivative suffix *-alli-* as another military title *tarriyanalli-* "third-in-command" (Watkins 1961: 7; Puhvel l.c.). Shevoroshkin (1979: 186) added the following personal names: Lydian *Τυιος* and Cilician *Τβιος*.

**dwoyo-* > Hittite *d/tā-* in the compound *d/tāiuga-, tāuga-, dāiga-* "two-year-old", cf. *yuga-* "yearling" = Old Indic *yuga-* "age, generation" (Cowgill followed by Eichner 1992: 56–57; Tischler 1991: 29–31 with older literature). A corresponding compound appears in Lithuanian *dveigỹs* "two-year-old". The same component *tā-* is attested in *tā*-UD-*ti* = *tā-*šiwatti* "on the second day" (Puhvel 1978: 99).

**dwoyom* "twice; for the second time" (orig. nom.-acc. sg. n.) > Hittite adv. *d/tān* "a second time, secondly, once again, over again, back again, in return" (Puhvel 1978: 99; Melchert 1994: 128 reconstructs **dwóyom* while Eichner 1992: 56 prefered **doyóm* after Greek *δοιόν*). For Hieroglyphic Lu-

wian *tu-wa-na* Meriggi 1962: 135 and 1966: 59 proposed the meaning "secundum" or "duplicem". Eichner 1992: 60 saw here a continuation of **dwoyóm* or **dweyóm*.

dwoyomói-* > Hittite *dam(m)ai-*, *tamai-*, *tāma-* "second, other" with pronominal declension besides the adj. *dam(m)eli-*, *tameli-* "of another kind, different, alien" (Eichner 1992: 57–58; he identifies the same suffix in such the formations as **medʰyo-mo-* "middle", **upo-mo-* "uppermost"). The other solutions seem to be less probable: (i)dwomo-(i-)* (Carruba 1974: 590; Kronasser 1966: 206 sees the ordinal suffix **-mo-* here, although **-mo-* in Old Indic *pañcamá-* "5th" is analogical with *daśamá-* "10th"; on the other hand, Puhvel 1978: 103, fn. 15 quoted the phonetic complements like **11**-*ma* through **14**-*ma* vs. the preceding ordinals **2**-*anna*, **3**-*anna*, **4**-*in*, **5**-*na* through **10**-*na* – see also Watkins 1961: 7–12); (ii) **dwoyósmōy* (Puhvel 1978: 102–07, assuming the same internal structure as in Old Indic *anyá-*, Gothic *aljis*, dat. sg. *anyásmai* & *aljamma* resp.).

**dwoyo-g$^{(h)}$o-* > Hittite **tagaiš* / **takiš* "other, second" > dat. sg. *takiya...takiya* "der eine...der andere" (Eichner 1992: 59–60 assumed here the same suffix as in **mon-o-gʰo-* "many" > Gothic *managS*). The alternative suffixation in **-g-* is also possible, cf. Germanic **ainaka-* > Icelandic *einka* "only", Norwegian *einkom* "alone" etc. and **twik-* > Norwegian *tvika* "to be in doubt", Swedish *tveka* "to be doubtful" besides West Frisian *twake* "two (eggs)", *trijke* "three (eggs)" (Ross & Berns 1992: 657–58).

dwi-(y)o-* in Lycian nom.-acc. sg. n. *kbi*, nom.-acc. pl. n. *kbija* "(an)other", *kbijẽti* "double, paired" (Melchert 1993a: 33–34); in compounds e.g. Lycian *kbisñtãta* "12" or "20" (dwi-k̑m̥t-ontā* – see Melchert 1993a: 34; Hajnal 1995: 159, fn. 172) or *kbisñne/i-* "two-year-old" (Oettinger 1994: 323; Melchert 1994: 315; the second member corresponds to Hittite *zēna-* "autumn").

dwisu* > Lycian *kbisu* = Milyan *tbisu* "twice" = ? Luwian **2-*šu* (Melchert 1993b: 298), cf. also Milyan *trisu*, Luwian **3**-*šu* and Hieroglyphic Luwian *tarisu* "thrice" (Eichner 1992: 61–62 reconstructs **dwis-wé* or **-won* analogically to Avestan *bižuuaṯ* < **dwis-wm̥t* or Old High German *zwiro* "twice" – all derivatives of **dwis* "twice", maybe hidden in Hittite **2**-*iš*).

**dwi-p(e)lom* "twofold, double" (?) > Milyan *tbiplẽ* with a multiplicative or distributive function. Shevoroshkin 1979: 182 derives Lycian loc. pl. *tupñme* "twofold, pair" (Melchert 1993a: 81) from **du-pl̥-mo-*.

Armenian:

**dwō* "2" > Armenian *-kow* in *erkow* "2" with *er-* after *erekʻ* "3" (so Bugge; Fr. Müller sees here a Kartvelian influence, cf. Svan *jéru* "2" – see Brugmann 1892: 469); *erko-* in *erko-tasan* "12" and *erko-kʻean* "both" corresponds to Greek *δύο*.

dwi-* > Armenian *-kir* in *erkir* "twice" (dwis*) and *-kin* in *krkin* "twofold" (**dwis-dwisnV-* *"twice-double" > "twofold") besides compounds as *erkeam* "two years old" (**dwi-somH-*) etc.

dwoi-* > Armenian *-ke-* in *erkeriwr* "200" (*hariwr* "100") and *kēs* "half" (dwoiḱo-*, cf. Old Indic *dviká-* "consisting of two pairs" with velar **-k-*).

**ʔwīḱm̥ti* > **ʔgisan(t)* > Armenian *k'san* (Huld 1984b: 59–67 proposed a compound of **sems* "1" as in Albanian *njëzet* "20" (lit. "1 x 20") and **wi-i *ḱm̥t-i*, metanalyzed in **(sem) + swī-ḱm̥t-* > *k'san*; **sw* > *k'* regularly, cf. *k'own* "sleep" < **swop-no-* etc.).

(Kortlandt 1994: 253, 255; Meillet 1936: 99–101; Winter 1992: 348, 351, 355)

? Phrygian:

dwoy-* in the name of the Phrygian twin-god *Δοιάς* (dwoym̥t-*), brother of *Ἄκμων* (Fick 1907: 347), and *Δοίοντος πεδίον* 'two lowlands in Phrygia' (Haas 1966: 162). Polomé 1986: 186 mentioned a possibility of a Greek origin, cf. the Greek gloss *δοιάς* "duality".

? Macedonian:

dwi-* in the compound known from the gloss *διπανάς· τούς διδύμους γεγενημένους* (Hesych.) (dwi-pawid-n*^{0} "of two children", cf. Greek *παιδνός* – see Blumenthal 1930: 19, fn. 2).

Greek:

**dúwo* (indecl.) "2" > Chalkidian *δύϝο*, Homeric, Attic, Ionic, Doric *δύο*; cf. the derivative *δυοστός* "half" remodelled after *ε'ικοστός* "20th".

dúwō* "2" (du.) > Homeric m.f.n. *δύω* (by duals of the *o-* & *ā*-stems) besides Aetolian *δύϝε*, Laconian *δύε* with the dual ending *-ε* of the third declension. The monosyllabic variant **dwō* continues in *δώδεκα* "12". Mycenaean *dwo* "2" (PY Eb 338, Eo 278, Ub 1315) is ambiguous (d(u)wŏ*), while the instr. *du-wo-u-pi* (= *duwou-phi*; PY Ep 704 – see Kazanskij 1986: 98) corresponds fully to Old Indic *duváu* – see Beekes 1969: 147). .

? **dwóu-tero-* "2nd" > **dweu-tero-* > Greek *δεύτερος* (Meier-Brügger 1993: 141, quoting the analogical assimilation in Greek *ἕτερος* "one of two", but Mycenaean *a_2-te-ro*, Doric *ἄτερος*; formally the same derivative appears in *ἀμφότεροι* pl. "both"). The traditional arguments against the derivation of *δεύτερος* from **d(u)wō(u)* was presented by Brugmann 1881: 298–301.

**dwi-* in **dwis* "twice" > Greek *δίς* etc. and in numerous compounds as *διπλός* "double" (= Latin *duplus*), *δίπους* "two-footed" etc.

**dwoiyo-* > Greek *δοιός* "twofold", pl. *δοιοί*, du. *δοιώ* "both", cf. the Mycenaean man's name *Du-wo-jo & Dwo-jo* (PY Jn 750; KN V 492, X 8126) = **Δϝοίος* *"Twin" (Kazanskij 1986: 169; 154).

**du-mo-* > Greek *-δυμος* appearing in the expressive reduplication *δίδυμος* "twofold", pl. "twins", attested already in the Mycenaean man's name *Di-du-mo* (KN X 5751, MY Oe 129) = dat. *Didumōi* (Kazanskij 1986: 92) and in the compound *ἀμφί-δυμος* "twofold", analogically also *τρί-δυμος* "three-fold".

**ewīḱm̥ti* "20" > Proto-Greek **ewīkati* > North-West Greek, Doric, Boeothian, Thessalian *ϝίκατι*, Pamphylian *φίκατι*, Herakleian *ϝείκατι*, Hesych.

βείκατι, Thera *ικάς*, *ἵκαδι* vs. Homeric, Ionic, Attic, Arcadic, Lesbic *εἴκοσι* besides Homeric *ἐείκοσι* (= *ἔἴκοσι*) with *o* after *-κοντα* forming the tens 30–90. Huld (1984b: 60) proposed a different solution based on the possibility to project Proto-Greek **ewīkati* into **se-wī-km̥ti* "1 x 20" (cf. Albanian *njëzet* "20" = "1 x 20" and Armenian *k'san* "20" with Huld's analysis above) where the first syllable has to correspond to *é-* in *ἑκατόν* "100", usually analyzed **se(m)-ḱm̥tom* "1 x 100".

(Chantraine 1968: 287, 301–02; Frisk I: 424–25; Kortlandt 1983: 100; Lejeune 1972: 81–82, 206; Schwyzer 1939: 588–89, 591; Waanders 1992: 370–71, 374, 383–85)

Albanian:

**dwōw* "2" > **dōu* > **dū* > Albanian *dy*. The feminine *dȳ* (e.g. Dushmani) could originate as follows: **dū* + f. ending *-ās* > **dū(w)ā* > **dyë* > *dȳ*. So called 'ablative' **dȳš* is probably formed as an original loc. pl. of *o*-stems in **-oi-su* (cf. Beekes 1995: 191), i.e. *dȳš* < **dyëš* < **dü(w)īsu* < **duwīsu* < **duweisu* < **duwoi-su*.

**d(u)wi-to-* "2nd" > **dü(w)i-to-* > **dyët-* > **dȳt-* > South Geg *i dyti*, North Geg (Gusi, Crna Gora) *i dȳti* etc.

**wi̯ḱm̥tī* "20" > **wi̯ǵatī* > **ʒ⁰atī* > **ʒ⁰äti* > Albanian *-zet* in *një-zet* "20", *dy-zet* "40", *tri-zet* "60", lit. "1 x 20", "2 x 20", "3 x 20" respectively. (N.B.: Hamp, the author of this etymology, reconstructed **-m̥̄-*. Huld 1984b: 65 proposed a more traditional and a less hopeful etymology: *një-zet* < **(s)myā-wī-ḱm̥t-oi*, assuming a substitution of the m. pl. ending **-oi* for the original dual. Quite improbable is the assumption of Çabej connecting the root *-zet* with late Greek verbal adj. *ζευκτός* "joined" — see Huld 1984a: 134).

(Hamp 1992: 853, 905–06, 919 and 1997: 95–96; Huld 1984a: 56–57, 133–34 with an survey of older etymologies; Kortlandt 1983: 101)

? Illyrian:

**dwi-* in composited place names as *Di-mallum*, *Δι-μάλη* *"two mountains" or *Δι-βολία* = Greek **δι-φυλία*, cf. *Tri-bulium* = Greek *Τρι-φυλία* (Krahe 1955: 101, 104, 107).

**dwi-to-* "2nd" > Illyrian personal name *Ditus* *"Secundus" (Mayer, *KZ* 66[1939]: 108).

Messapic:

**dwŏ* "2" > Messapic *doa* .

**dwi-to-* "2nd" > Messapic *ditan* "alteram", *ditais-si* "aliisque"; cf. also the gentile name *Diθehaihi*, gen. of **Ditiaos* *"Secundus" ?

(Haas 1962: 53, 72, 90, 122, 202, 212–13)

Italic:

**duwō* "2" m. > Latin nom.-acc. *duo* m., n. (with iambic shortening, cf.

Sommer 1902: 493) represents the last relic of the dual inflection; for the other forms (gen. *duōrum*, dat.-abl. *duōbus*) including the neuter *dva* (*CIL* III: 138) the plural inflection is characteristic. The plural inflection is also characteristic for all known Umbrian forms: acc. n. *tuva* corresponds perhaps to Latin n. *dva*. Nom. m.-f. *dur* can be derived from **duūr* < **duōs* = Latin nom. pl. *duōs*. Acc. m.-f. *tuf* reflects **duō-* + *-ns* (common gender) rather than **duā-* + *-ns* (f.). Dat.-abl. *tuves*, *tuver-e*, *duir* < **dueis* < **duois* (Buck 1905: 86; Coleman 1992: 392).

**duway* "2" f. >> Latin *duae* f. (with the ending of nom. pl. of the *ā*-stems, cf. the substantival gen. form *duā rum*).

dwi-* in **dwis* "twice" > Old Latin *duis* (Cic. *Or.* 153), Latin *bis*, and **dwisno-* > Latin *bīni* "in twos", besides numerous compounds with the first member **dwi-*: Old Latin *dui-dēns* "bidens", gloss. *diennium* "biennium" (dwi-atnyo-*) and *dīmus* "bimus" (**dwi-himos*), *bipēs* "two-footed" etc.

**du-* in **dut(i)yo-* > Umbrian acc. sg. n. *duti* "a second time" (*Ig* 6B63), **du-b^{h}i* *"on two sides" > Latin *dubius* "doubtful", besides numerous compounds as Umbrian dat.-abl. pl. *dupursus* "biped, men" (*Ig* 6B10) < **dupodufs* < **du-pod-b^{h}os*, **du-plo-* "twofold" > Latin *duplus* "double", Umbrian acc. pl. f. *dupla* (*Ig* 6B18), abl. pl. m. *tupler* (*Ig* 5A19), **du-pl̥H$_2$k-* > Latin *duplex* "twofold", Umbrian *tuplak* "two-pronged (fork)" etc.

**wi-dk̂m̥t-ī* "20" > **widĝm̥tī* > **wīĝentī* > Latin *vīgintī*.

(Buck 1905: 86–87; Coleman 1992: 390–92, 397–98, 404–405, 416, 419, 422–23; Sommer 1902: 493; WH I: 104–06, 375–76, 381–84)

Celtic:

Cowgill (1985: 22–25) reconstructed the protoforms for the Celtic numeral "2" as follows:

**duwo* "2" m. > Goidelic **duva* > Early Irish **dou* > Old Irish *dáu*, later *dó* & proclitic *da* // Brythonic **dou* m. > Old Welsh *dou*, Middle Welsh *deu*, New Welsh *dau*, Middle Cornish *dow*, *dew*, Old Breton *dou*, *dau*, Middle Breton *dou*, *daou*, Modern Breton *daou* (Cowgill 1985: 24 admits that the reconstruction of Goidelic **duvō* < **duwōu* is also possible, but he prefers a different solution for the limitation of the forms terminated in **-ōu*).

**duweH$_2$iH$_1$* "2" f. > Celtic **duwai* > **duvī* > Brythonic **dui* > Welsh *dwy*, Old Cornish *dui*, Middle Cornish *dyw*, *dew*, Breton *diou* // Old Irish *di*; Gaulish (La Graufesenque) *doedo* "in two parts" (= Old Indic *d(u)ví-dhā*, *dvē-dhā* "in two ways, in two parts, twofold, divided", Old English *twœde* "doubled, containing two of three parts of a whole; two parts of three" – see Fleuriot, *Études celtiques* 17[1980]: 120).

**dwi-* in **upo dwís* > Old Irish *fo dí* "twice" (cf. also Greene 1992: 521); but the perfectly corresponding Gaulish (Larzac) *uo-dui* < **upo-dwĭ* does not indicate the final **-s* (see Lambert 1994: 167 and 1996: 74 where he reconstructs **upo-dwī*, seeing in **dwī* a feminine; similarly Koch 1996: 37–39 who interpreted the passage *...uo- dui-uo.derce lunget* "...in two manifestations

maintains", referring to Welsh *gollwng*, Old Irish *fo loing* "supports, maintains" and *fodirc* "visible"; on the other hand, Meid 1996: 42–44 rejected this reading, preferring another transcription *uo dunoderce*).

Vendryes & Lambert 1996: D-6 present a different solution:

dwōw* >dwāu* > Old Irish *dáu*; Old Welsh *dou* etc. for m. (cf. Greene 1992: 505);

**dwī* > Old Irish *dí*, but **dwei* > Welsh *dwy*, etc. for f.

**dwoy-* in oblique cases: gen. **dwoyu* > Goidelic **dwēyu* > proto-Irish **dé* > Old Irish *da*^{L} (Kortlandt, *Ériu* 37[1988]: 92 derives gen. *da* from **dāwōs*, remodelled after nom *dáu* < **dāwū* in his reconstruction); dat. **dwoi-b^{h}yem* > Goidelic **dwēbyen* > Old Irish *deib*^{N}, *dib*^{N} (Greene 1992: 506; Vendryes-Lambert 1996: D-6).

**dwei-* in **dwei-plo-* > Old Irish *diabol* "double". Cf. Old Brythonic *Δουηκαληδόνιος* (Ptolemy II 3,1; VII 5,2; VIII 3,2, see Cowgill 1985: 21).

**dwei-ko-* or **dwi-ko-* > Old Irish *dechenc* "couple, group of two persons" (Vendryes & Lambert 1996: D-31).

Concerning Old Irish *dïas*^{L}, gen. *de(i)sse* "two persons" and *déde*^{N} "two things", Hamp (1982: 178) found a tempting solution, reconstructing the collective **dwis-ad-* in Celtic, formally corresponding to Greek *δυάς*, gen. *δυάδος* "pair, couple", which continues in **dwisad-s*, gen. **dwisad-os* > *(Fer) Diad*, lit. "(man) of pair", a foster-brother and later a rival of Cú Chulainn. Further *dïas*^{L}, gen. *de(i)sse* "two persons" < **dihassā* < **dwisad-tā* and *déde*^{N} "two things" < **dihadiyan* < **dwisad-ion*.

**wikm̥tī* > Old Irish *fiche*, gen. *fichet*, dat. *fichit* (Thurneysen 1946: 247; Pokorny 1959: 1177 reconstructs **wikm̥ts*); Middle Welsh *ugeint*, New Welsh *ugain*, Cornish *ugens*, Breton *ugent*. Pokorny l.c. explains the substitution **gwy-* >> *u-* under the pressure of the compound **dou-viceint* "2 x 20" > Welsh *deugaint* "40". But the infuence of the numeral "1" (Welsh, Cornish, Breton *un*) appears to be more probable: the vigesimal system in Brythonic (Middle Welsh *deugeint* "40" = "2 x 20", *triugeint*, *trugein* "60" = "3 x 20", Welsh *pedwar ugain* "80" = "4 x 20") implies that "20" represents a unit, hence "1 x 20".

In the Gaulish personal names *Bocontius*, *Bocontia*, *Vocontius* and the ethnonym *Vocontii*, the numeral "20" can be hidden, if **voconti* < **(d)wo-kont-i* with **(d)wo-* instead of expected **(d)wi-* after the (unattested) cardinal and **-kont-* instead of expected **-kant-* < **-km̥t-* under the influence of the higher tens "30–90", e.g. *trIcontis* "30" (de Bernardo Stempel 1987: 110).

(Cowgill 1985: 22–25; Vendryes & Lambert 1996: D-6, 65, 66, 69)

Germanic:

The most detailed analysis of the Germanic numeral "2" (and Germanic numerals at all) was presented by Ross & Berns (1992: 562f):

**dwow* "2" nom.-acc. m. > Germanic nom.-acc. pl. n. **twau* > Old Icelandic *tuau*, Modern Icelandic *tvö*, Faeroese *tvey*, Modern Norwegian *tvau*;

**dwō* "2" nom.-acc. m. > Germanic nom.-acc. pl. n. **twō* > Old Icelandic *tú*, Old Swedish, Old Danish *tū*, Old English *tū*. Under the influence of the definite article (Gothic acc. m. *þans* and nom.-acc. f. *þos* < **þōz*), analogical forms of the numeral "2" originate: acc. m. **twanz* > Gothic *twans*, Old Icelandic *tuá* and nom.-acc. f. **twōz* > Gothic *twos*, Old Icelandic *tvær*, Old Saxon *twâ & twô*, Old High German *zwâ & zwô* etc. Scandinavian **tū* + **tegu-* "10" (< **dekm̥*) > Scandinavian **tutigu* "20" > Old Icelandic *tiogo*, Old Norwegian *tiugu*, Old Swedish *tiughu* etc., with haplological loss of the first syllable. Old Icelandic *tottogo*, Old Norwegian also *tuttugu*, *tutigu* "20" have perhaps origin in a form corresponding to the unattested Gothic acc. **twans tiguns*.

dwoy* "2" nom.-acc. f.-n. > Germanic nom. pl. m.twae* > Gothic *twai*; Old Icelandic *tveir*, Runic Swedish *tuaiR*, Old Swedish *twē(r)*, Old Gutnic *tueir* etc.; Dutch dial. (Maastricht, Goerse) *twie* etc. Ross & Berns 1992: 567 also reconstruct **twaeu* (with adjectival *-u*) > Old High German *zwei*, Old Saxon *twē*, Old Frisian, Old English *twā*; Gothic *twa* with *-a*, instead of the expected **two*, is due to analogy with the adjectives. Germanic gen. **twajō* (reflecting rather gen. pl. **dwoyōm* than gen. sg. **dwoyous* – in contrary Beekes 1995: 565) continues in Gothic *twaddje* (with gen. pl. m.-n. in *-e* forming numerous nouns, adjectives and pronouns, cf. Voyles 1987: 490, fn. 9), Old Icelandic *tveggja*, Old Saxon *tweio*, Old High German *zweiio*, *zweio* etc. and dat. **twaimiz*, *twaemuz*, *-az* > Gothic *twaim*, Old Gutnic *tuaim*, Old Icelandic *tveim(r)*, Old Swedish *twēm*, Old High German *zwêm/n*, Old Saxon *twêm/n*, Frisian *twâm*, Old English *twæm*. Only dat. *twaim tigum* is known for "20" in Gothic (the unattested nom. **twai tigjus* < Germanic **twae tegewes* "two tens"), while in West Germanic it is a common form reconstructible as **twaimteg*, *-tig*, *-tug* > Old High German *zweinzug*, Middle High German *zweinzëc,-zic*, Old Saxon *twentig,-teg,-tich,-tech*, Dutch *twintig*, Old Frisian *twintich*, *-tech*, Old English *twēntig*.

Cf. further Germanic **twa-liƀą & *-lifą* "12" (lit. "two left") > Gothic *twalif*, gen. *twalibe*, dat. *twalibim* (but Crimean Gothic *thune-tua* "12" = "10 + 2"), Old High Germanic *zwelif*, Old Saxon *tuuelif*, Old English *twelf*, Old Icelandic *tolf* etc. besides the abstract **twalifti-* > Old Icelandic *tylft* "dozen", Old Swedish *tylpt*.

dwi-* in **dwis* "twice" continuing probably in its gen.-loc. du. **dwiswous* (perhaps contamined with **dwis-wēro-*) > Germanic (i)twiswauz* > Old Icelandic *tysuar*, Old Swedish *twiswar*; (ii) **twizwauz* > Old High German *zwiror*; (iii) **twizwaus* > Old High German *zwiro* besides Ingvaeonic **twiwō* > Old English *t(w)uwa*, Old Frisian *twi(i)a*, Old Saxon *twîo* etc., and with adverbial *-es* in Middle Low German *twîges & tweyes*, early Modern Frisian *tweis*, English *twice*; **dwisno-* > Germanic **twizna-* > Old Icelandic *tuiþr & tuinnr*, Old Swedish *twinni* "two", besides an umlauted form **twezna-* > Old Icelandic *tueþr*, Icelandic *tvennr*, Swedish *tvenne* "of two kinds", Old English *getwinn* "twin" etc.; **dwist(H)-* > Germanic **twist-an-* > Old (West ?) Germanic

Tuisto (Tacitus, Germania 2.2); further in compounds like Old English *twi-fēte* "two-footed", Old High German *zwi-houbit* "two-headed" etc. The isolated Old Icelandic *tuttán* "20" (**twī-tēχan* with the second member forming teens, cf. e.g. *siaután* "17", *áttián* "18") could perhaps be remodelled under the influence of **twi-* via **twī-χanþī* (cf. the tribe name *Tuihanti* attested in two altar-inscriptions, found near Housesteads by Hadrian's wall, dedicated to *Deus Mars* by *Tuihanti*, described in one as *Germani*, in the other as *cunei Frisiorum* – see Szemerényi 1960: 170–71, finding the closest parallel in the Gaulish tribal name *Vocontii*) from **wīkontī* (*-o-* according to the higher tens like in *Vocontii* – see above).

**dwei-* in **dweikno-* > Germanic **twīxna-* > Gothic nom. pl. m. *tweihnai* "two each"; Proto-Norse **twēxnR* > **twēnR* > Old Icelandic *tuénn* "double", Old Frisian *twîne* "two, of two kinds, double", cf. also Old English dat. pl. *be ... twēonum*, English *between*; **dwei-plo-* > Germanic **twīfla-* "doubt" > Gothic *tweifl(s)*, Old High German *zwīfal*, Old Frisian *twîfel* etc.

Like in the case of the Celtic numeral "2", Cowgill (1985: 13f) proposed the best founded alternative solution:

**duwo* "2" (uninflected) > Gothic nom.-acc. n. *twa*, Crimean Gothic *tua*; Cowgill 1985: 14 opines that Old Icelandic nom.-acc. n. *tvau* belongs here too, explaining *tvau* from **tva* plus **-u* < Germanic **-ō* of polysyllabic neuter plurals (so already A. Kock, *PBB* 15[1890]: 250f).

**duwoyH*$_1$ "2" n. du. > Germanic **twai* > Old Saxon *tvē*, Old English, Old Frisian *twā*, Old High German *zwei* (with *-i* taken from gen. *zweiio* and dat. *zweim*).

Balto-Slavic:

**d(u)wṓ* "2" m. > East Baltic **d(u)vúo* > Lithuanian nom.-acc. m. **d(v)úo* > *dù*, Old Latvian **duo* in *duokart*, *duoreiz* (Adolphi 1685), *dū* (1732), while modern Latvian m. *divi* was remodelled according to f. *divi*; Yatwingian *duo* // Slavic **dŭva* m. > Old Church Slavonic *dъva*, Bulgarian, Macedonian *dva*, Serbo-Croatian, Slovenian *dvâ*, Czech, Slovak *dva*, Upper Sorbian *dwaj*, Lower Sorbian, Polish *dwa*, Polabian *dåvo*, Old Russian *d(ъ)va*, Russian, Ukrainian, Byelorussian *dva*. **Dъva* plus **desęti*, the dual of **desętь*, form the numeral "20" in Slavic: Old Church Slavonic *dъva desęti*, Old Czech *dvadcěti*, Upper Sorbian *dwaceći*, Russian *dvádcat'* etc.

**d(u)wai* "2" f. > East Baltic **d(u)vái* > Latvian nom. f. **duvi* > *divi*, Lithuanian nom.-acc. f. **dvie* > *dvì* // Slavic **dŭvě* f.-n. > Old Church Slavonic *dъvě* & *dьvě*, Bulgarian, Macedonian *dve*, Serbo-Croatian, Slovenian *dvê*, Slovak *dve*, Czech *dvě*, Upper & Lower Sorbian *dwě*, Polabian *dåve*, Polabian *dwie*, Old Russian *dvě*, Russian *dve*, Ukrainian *dvi*, Byelorussian *dzve*.

**d(u)woi* "2" n. (?) > Prussian *dwai* acc. m. (Toporov 1975: 395 judges that n. was generalized).

In Lithuanian the expected nom.-acc. n. **dvíe* could be recognized in **dvie-li(e)ki(e)* "12", remodelled in *dvýlika* after *trýlika* "13" (Stang 1966: 281

following Mažiulis). Slavic **dŭvě* n. merged with f. Cf. also **dŭvě sŭtě* "200" > Old Church Slavonic, Old Russian *dъvě sъtě*, Czech *dvěstě*, Upper & Lower Sorbian *dwěsćě*, Polish *dwiesćie* etc.

**d(u)woi-* in oblique cases: **d(u)woy-ou(s)* > Old Church Slavonic gen.-loc. *dъvoju*, Lithuanian adv. *dvíeau(s)* "in two", **d(u)woi-m(ō)* > Old Church Slavonic dat.-instr. *dъvěma*, Lithuanian dat. *dviẽm*, instr. *dviẽm*, and with **-yo-* extension in Slavic **dŭvojь,-ja,-je* m./f./n. "double" > Old Church Slavonic *dъvoi / dъvoja / dъvoje* etc.

**d(u)wei-* with **-yo-* extension in Lithuanian collective-distributive *dvejì*, Latvian *divẽji* "je zwei", *dvẽja* "two kinds of", *dvẽjetas* "duality" and in the derivative **dweig$^{(h)}$o-* > Lithuanian *dveigỹs* // Serbo-Croatian *dviz* "two-year-old" (Trubačev 1978: 189–90 rejected a compoud corresponding to Hittite *dāyuga-* "two-year-old", where *yuga-* means "yearling" – see above; he prefers the comparison with Greek *δισσός* & *διττός* "double" < **δϝιϝιός*, while the compound **dwi-* & **yugo-* continues undoubtedly in Slovincian *dvjĩgɵ* "yoke for two oxen" = Latin *bīgae* < **dwi-yugai*).

**dwi-* in derivatives as Lithuanian *dvỹnas*, *dvynỹs*, Latvian *dvīņi* "twin"// Old Russian *dvína* "couterus" (extended in **-īno-/-ā*, cf. Sławski 1974: 120–23) and in compounds like Lithuanian *dvìdešimt*, Latvian *div(i)desmit* "20", Prussian *dwigubbus*, Lithuanian *dvìgubas* "double" (but Old Church Slavonic *dъvogubьnъ* "duplus, geminatus", Slovenian *dvogùb* "double" etc.), *dvikõjis* "two-footed" etc.

(Comrie 1992: 731–35, 774; Fraenkel I: 107–08; Karulis I: 220–21; Stang 1966: 277; Toporov 1975: 395–96; Trubačev 1978: 185–93; Vaillant 1958: 621–26; Zinkevičius 1984: 11–12)

Tocharian:

**dwōw* "2" m. > A m. *wu*.

**dway* "2" f. >A f. *we*, B m. & f. **wai* > *wi* (after *antapi* "both"; the old diphthong could be preserved in *wai* "and", originally perhaps gen.-loc. du. of the numeral "2", cf. Van Windekens 1976: 540, Klingenschmitt 1994: 341). On the other hand, Adams 1988: 38 reconstructed **dwoy*.

dwi-* in **dwito-* "2nd" > A *wät*, B *wate*, *wäte*, and in compounds like B *wi-pew* "two-footed" (dwi-pedwent-* ?).

**dwist(H)o-* in adv. **dwist(H)ā*, orig. nom.-acc. pl. n. > A *wäṣt*, B *wasto*, *wästo-* "double" (Čop saw here abl. or instr. sg. in **-ō(d)* – see Hilmarsson 1986: 154).

**dweist(H)o-* + adverbial suffix **-ōr* > distributive suffix *-ār* continues in B *yästār* "je das Doppelte" (Van Windekens 1979: 283; Klingenschmitt 1994: 325–26).

wi̯k̑n̥ti* "20" > A *wiki* & *wīki*, B *ikäṃ* & *īkäṃ*. One would expect A **wikäñc*, B **ikäñc* (Van Windekens 1976: 572 who assumed **wi̯k̑n̥t*). As for the puzzling termination, Werner (1992b: 116–17, 139–40) saw in it a contamination with the ordinals A (unattested) **wikiñci*, B *ikante* (ikäñcte*) and a

following back-formation consisting in a separation of *-ñci* and *-te* resp. Adams (1991: 39, fn. 50) solves the problem of the termination by reconstructing proto-Tocharian **w'ikänn* < **w'ikänt* < **wi(d)ḱm̥tḗ*. Kortlandt (1991: 8) presented another, less convincing solution. He assumed a loss of the expected final **-i* (the inanimate dual marker) in analogy to **dekm̥t* "10", while *-i* in A *wiki* is supposed to be a copy of the particle *-pi* in such instances as *wiki ṣapi* "21".

(Adams 1988: 15, 19, 137; Van Windekens 1976: 585–86; Werner 1992b: 103–04, 116–17

§2. Reconstruction and internal analysis

1. The analyzed material allows to reconstruct an uninflected *o*-stem **d(u)wo*. Among the inflected forms representing the dual of an *o*-stem for m. & n. and *ā*(= eH_2)-stem for f., only nom.-acc. and gen.-loc. are hopefully reconstructible (Oettinger 1988: 356–59; Adams 1991: 22–23; the reconstruction **-$H_2(i)H_1$* was already anticipated by Risch 1975: 253, fn. 15 and Watkins 1975: 368):

	masculine		neuter		feminine	
	Brugmannian	laryngealistic	Brugmannian	laryngealistic	Brugmannian	laryngealistic
nom.-acc.	**d(u)wōw*	**d(u)woH$_1$w*	**d(u)woy*	**d(u)woiH$_1$*	**d(u)wai*	**dweH$_2$iH$_1$*
gen.-loc.	**dwoyou(s)*	**dwoy(H)ou(s)*	= m.	= m.		**dweiH$_2$iH$_1$ou(s)*

Beekes (1995: 194) differentiated gen. and loc., reconstructing **-H$_1$e/oHs* (> Avestan *-å*) vs. **-H$_1$ou* (> Avestan *-ō*) resp. He also tried to take care of the problem of *b^h-* and *m*-endings in dat./instr./abl., postulating dat.-abl. **-me/oH* vs. instr. **-b^{h}iH$_1$*, and their later contamination. Elsewhere (p. 212) he reconstructed loc. **dwoyHous* on the basis of the Germanic forms with 'Verschärfung' (Gothic *twaddje*, Old Icelandic *tveggja*). Adams (1991: 23) explained the presence of the laryngeal in some forms by assuming their rebuilding on the basis of locative duals in non-thematic stems. The most important difference between Beekes on the one hand and Adams & Oettinger on the other hand consists in the reconstruction of the nom.-acc. Beekes 1995: 212 reconstructed only m. **dwo-H$_1$* vs. f.-n. **dwo-iH$_1$* (Kortlandt 1991: 5 sees in **-iH$_1$* a contamination of two originally different markers of dual: animate **-H$_1$* and inanimate **-i*). Beekes admitted that he was not able to explain satisfactorily the final *-u* in Old Indic *dváu* and the uninflected Greek *δύο*. Hollifield (1980: 48) and Eichner (1992: 47–48) analyzed the final **-ōw* < **-o-H$_1$-w*. Oettinger (1988: 358, fn. 15) mentioned the variant **-o-H$_1$-u* (quoted also by Eichner l.c.) giving Indo-Aryan **-āu* due to the Brugmann's law. Accepting the 'Brugmannian' reconstruction of nom.-acc. m. **d(u)wōw* (with a regular sandhi variant **d(u)wō*) and gen.-loc. m. **dwoyou(s)*, Adams (1991: 20) identified here a 'dual collective' **-(o)u-*. If we separate it, we reach uninflected **d(u)wo* and inflected dual with the minimum paradigm nom.-acc. **d(u)wō* vs.

obl. **dwoy*. It is tempting to mention a parallel situation for the Semitic numeral "2" reconstructible only in dual (**-ni* represents 'nunation', i.e. the determiner characteristic for the dual which is missing before a noun):

	m.	f.
nom.	**ṯín-ā(-ni)*	**ṯín-at-ā(-ni)*
acc.-gen.	**ṯín-ay(-ni)*	**ṯín-at-ay(-ni)*

(Moscati 1964: 94; Dolgopolsky 1995, p.c.)

This remarkable parallelism between the Indo-European dual of *o*-stems and the common Semitic dual was mentioned e.g. by Cuny (1930: 41–42 and 1946: 251, 254) or Levin (1990: 155–57, 1992a: 252). Levin (1992b: 117) tries to find an exact correspondent to the Indo-European nom.-acc. dual ending **-ōw* in such the Hebrew dual forms as *yrḥw* "two months" (Gezer calendar inscription) or *w-ydw* "and [a man's] hands" (1x in Ezekiel 1:8). On the other hand, in his review of Cuny 1930, Kořínek, *Listy filologické* 61[1934]: 201–07 asked, why just the dual of *o*-stems corresponds to the common dual in Semitic. Let us add an analysis of Egyptian m. *sn.wj*, Coptic *CNAY* "2" vocalized and analyzed by Vycichl (1957: 363) as follows: **s(i)nỉwwʿj* < **sinỉwwaj* < **siny- -ū- -āy* , i.e. ROOT + PLURAL + DUAL. For support Vycichl quoted convincing examples demonstrating the derivation of the dual from the plural stem, e.g. Arabic *ʔanta* "thou" : *ʔantum* "you" : *ʔantum-ā* "both you". Vycichl's analysis allows a suggestive identification of the Indo-European and Egyptian markers: **-oy- // *-āy-* (dual) and **-u // *-ū-* (collective // plural) (l.c. 365).

Villar (1991: 136–54) isolated the pure root **du*, while the forms **dui/*duoi/*duei* and **duō(u)* are interpreted as plural and dual respectively. It can be supported by the following paradigm of the masc. demonstrative stem **so-/*to-* "this, that" (Brugmann 1911: 374–75; Beekes 1995: 204):

	sg.	pl.	du.
nom.	**so*	**toi*	**tō(u)*
acc.	**tom*	**tons*	= nom.
gen.	**to-syo*	**toi-/*te-som*	**toy-(H)ous*
dat.	**to-sm-ōi*	**toi-m/bʰus*	?
loc.	**to-sm-i*	**toi-su*	**toy-(H)ou*

The *o*-grade **dwoi-* extended in **-yo-* (or **-Ho-* according to Beekes 1995: 216) forms an adjective with a collective meaning. The form **dwi-* appears frequently in compounds (e.g. **dwi-* + *ped-/ pod-* "two-footed"). There are very old derivatives as **dwis* "twice", **dwisno-* "twofold" (in Anatolian "two-year-old" ?), **dwi-pl(o)-* (besides **du°* and **dwei°*) "twofold". Besides the very archaic ordinal **dwi-yo-* (or **du-yo-* ?) attested only in Anatolian there are innovations in *-t-* (**dwi-to-/-tyo-/-tĭyo-*) in Indo-Iranian, Albanian, Illyrian, Messapic, Umbrian, Tocharian (cf. the most recent innovations in German

zweite and Bulgarian *dveḱi* for **dveti*, i.e. cardinal *dve* + ordinal suff. *-t-*, see Comrie 1992: 735) and probably in **-tero-* in Greek. The same suffix forms the ordinal "2nd" (orig. "other") in some other branches: **H_2en-tero-* > Old Indic *ántara-* "far, various, other", Avestan *aṇtara-* "other, second", Khotanese *handara-*, Ossetic Digor *ændær* "other"; Armenian *andra-* "back, again"; Gothic *anþar*, Old Icelandic *annarr* "other, second", Prussian *anters,-ars*, Lithuanian *añtras & añtaras* id., ? Old Church Slavonic *vъtorъ*, Upper Sorbian *wutory* "second", cf. Czech *úterý* "thuesday", vs. **H_2en-yo-* > Old Indic *anyá-* "other, various, foreign", Avestan *aṅiia-*, Hittite *han-ti* "anderswo", Armenian *ayn* "ille" (Pokorny 1959: 37; Mann 1984–87: 27; EWAI I: 80) and **H_2el-tero-* > Latin *alter* "other", Middle High German *alder* "or, else" besides **H_2el-yo-* > Celtic **alyo-* "second" > Gaulish (Coligny Calendar) **alio-* "second" (Olmsted 1988: 268, 293–95), Old Irish *aile* "second, other", further Armenian *ayl*, Greek *ἄλλος*, Latin *alius*, Gothic *alja-*, Tocharian A *ālya-k* "other" etc. (Pokorny 1959: 25–26). Let us mention a remarkable parallel in Semitic: Ugaritic *ʕl* "second" (Segert 1984: 196). Is it an accidental coincidence, a result of an areal influence or even a common heritage?

At first sight the numeral "20" seems quite ambiguous. In the first approximation it can be reconstructed as **wiḱm̥tī* (Szemerényi 1960: 23–25), in the laryngealistic projection as **H_1wiH_1ḱm̥tiH_1* = **ʔwi-ʔḱm̥t°*. This reconstruction allows us to assume an original compound **dwi-dḱm̥t-iH_1* "two-ten-DUAL with a following dissimilation **dwidḱ°* > **ʔwidḱ°* and with a further assimilation in **ʔwiʔḱ°* (cf. Kortlandt 1983: 100). Less probable, because inconsistent appears to be the point of view of Brugmann (1911: 11), identifying in **wǐ-* the root **wi* appearing in Old Indic *ví* "auseinander", *vi-ṣva-* "nach beiden Seiten", *u-bhaú* "both" etc. (cf. yet Hollifield 1980: 48 who reconstructs **H_1wiH_1-dḱm̥t-iH_1*, seeing in *H_1w* a numerical element meaning "2").

§3. Etymologies and their comments

1. Stewart (1906: 234) derived the numeral "2" from the root √*dŭ* "in die Ferne gehen", comparing the semantic development to Klamath *spéluiš* "index finger", related to *spélšna* "to put it forward". Similarly Schmid (1989: 12–13) and Lehmann (1991: 135 and 1993: 254) derived the numeral "2" from the root **dew-* "distant, further", assuming the primary semantics *"that one farther away".

But the correct reconstruction should be **dweH_2* – with the probable primary meaning "to withdraw, retire" (EWAI I: 739), cf. Old Indic *dūrá-* "far", *dávīyas-* "farther", *daviṣṭha-* "farthest" = Old Persian *duvaišta-*, Hittite *tūwan* "far" (**dweH_2m* with the regular loss of **H_2* – see Hollifield 1980: 48), Armenian *erkar* "long, slow", Greek adv. *δηρός*, Doric *δᾱρός* "for a long time", Greek *δήν*, Doric *δ(ο)άν* "far", Old Church Slavonic *davě* "at one time" etc. (Pokorny 1959: 219). It is evident that neither the numeral **d(u)wō(u)* "2" nor its bare root **du-* are derivable from **dweH_2-*. On the other hand, the opposite

development is more plausible phonetically, morphologically (concerning *-eH_2-extension – see Kronasser 1966: 422–32, esp. 430; Watkins 1969: 158) and also semantically (cf. Middle Persian of Turfan *dwdy* "ferner, dann" < Iranian **dvit(y)a-* "second" – see Emmerick 1992b: 320).

2. There are various attempts to divide the numeral into two parts: **dV-* plus the rest.

Blankenstein (1907: 110) analyzed the numeral "2" in **de & *we*, identifying the first member, a proper bearer of the meaning "2", with the first syllable of **dekm̥t* "10" (= "2 hands"), and the second member with **wĕ* "or" (why ?) (Pokorny 1959: 75).

3. Separating the dual ending **-ō(u)*, Erhart (1965: 19–33, 1970: 90–94 and 1982: 139) reconstructed **d(u)w-(o)* < **d°H^{w}o-* and found a bearer of duality in **-H^{w}o* (**H_3* = **H^{w}* as the dual marker is besides Erhart reconstructed probably only by Cowgill 1985: 27, fn. 1: **duwoH_3*). Like Blankenstein, Erhart assumes the same origin of the initial dental of the numerals "2" and "10", but contrary to him, he expects its meaning to be "one". Hence **d(V)-H^{w}o* = "1 x 2" and **de-km̥t* = "1 x 10". The Erhart's identification **d(V)-* = "1" was independently supported by Olzscha (1968: 146), who deduced from the dual **dw-ō* "2" the singular **du* *"1". He found an unexpected evidence in Etruscan *θu* "1". Holmer (1966: 25–26) separated **d-* and also found it in **dekm̥* "10", while the primary bearer of the meaning "2" would be **-w-* (~ Basque *bi* "2" < **wi* ?!).

The original meaning of this **dV-* seems to be more probably deictic than numerical, cf. Slavic **ed-inъ* "one", orig. "that one", and perhaps Crimean Gothic *ita* "one", derived by Hamp from the unattested compound **ita-aina-* (Lehmann 1986: 208). If we accept the deictic function of **dV-*, it could be identified with the anaphoric pronoun attested in Prussian acc. *din* "him", *dien* "her" etc. and Avestan, Old Persian acc. *dim* "him, her" (Brugmann 1911: 391). The most serious objection consists in vocalism. In the case of **di- + *H^{w}o*, one could assume an irregular development **diwo* > **duwo*. But how to explain **di-* ("that" ?) + **km̥t* ("hand") > > **dekm̥t* "10"? Why the meaning is not "5" or why is **km̥t* not in dual ? The further serious objection concerns the determination of the laryngeal marker of the dual: it was probably **H_1* and not **H_3* (cf. Hollifield 1980: 48; Oettinger 1988: 356–59; Adams 1991: 22–23; Beekes 1995: 194–95).

4. In agreement with his premise that the Indo-European counting system was based on fingers beginning with left little finger, Fay (1910: 416) tried to identify the "left ring-finger" in "2". But his attempt to find a source of the type Greek *δύη* "miseria", eventually Old Indic *dv-iṣ-* "odisse" ("in view of the weakness of that finger"), was not convincing even for him and so he admitted a different derivation.

5. There are various attempts to find external cognates:

5.1. Semitic **tauʔām* "twin" with two variants: (i) **táuʔam* > Arabic *tauʔam* "one of the twins", Hebrew pl. *tōʔăm-īm*; (ii) **tuʔắm* > Arabic *tuʔām* "twins, a twin, something double", Hebrew pl. *təʔōm-īm*, Judeo-Aramaic

t̲i̲ōm, Syriac *tāmā* (> *Θωμᾶς*, 3x called "*δίδυμος*" in John's gospel 11.16, 20.24, 21.2), Akkadian *tū(ʔ)amu(m)*, New Assyrian *tuʔû* (Brockelmann 1908: 79; AHw 1364; Klein 1987: 688), cf. Brunner 1969: 81; Levin 1992a: 255–56 (Semitic + Greek *δίδυμοι* "twins"). This comparison implies an **-m-* extension in Semitic (cf. Cuny 1924: 413–14).

Brockelmann (1908: 384) and Cuny (1924: 361, 396) tried to demonstrate that it is derived from the root √*w-ʔ-m*, cf. Arabic *wāʔama* "he agreed mutually, imitated". Dolgopolsky (p.c.; Jan 1999) does not agree with them.

5.2. Balto-Fennic **to-ńće* "second" (with the ordinal suffix **-ńće*) > Finnish *toinen*, gen. *toisen*, Estonian *teine* ~ *tõine*, Livonian *t'oy*, gen. *t'oyz* etc. (SKES 1327–28), cf. Menges 1964: 27 inspired by Schott 1936: 90 (Indo-European + Balto-Fennic).

Majtinskaja (1979: 182) derived this word from the demonstrative root **tɣ*.

5.3. There are remarkable Altaic parallels:

Turkic **düř* "equal", **[d]üŋ* "pair" // Mongolian **ǯi(w)rin* "2" (about women) // Tungus **ǯöwi(-är)* "2" // Old Korean **tüpɔ̈r* ~ **tüβɔ̈r* "2" > early Middle Korean *tufuri*, Middle Korean *turh* // Old Japanese *ture* "companion" (Blažek 1997: 44, 55, 63), cf. Koppelmann 1933: 54 & Kořínek 1935: 272, fn. 1; Menges 1964: 25–27 (Indo-European + Korean + Tungus + Balto-Fennic). Accepting the relationship of Altaic and Indo-European numerals "2", Starostin 1991: 33 reconstructed proto-Altaic **diüwV* "2".

But there are certain discrepancies. In agreement with the 'Moscow Nostratic school', proto-Altaic **d-* corresponds to Indo-European **dʰ-*, not to **d-*, while a regular correspondent of Indo-European **d-* should be proto-Altaic **t-* (Illič-Svityč 1971: 147). On the other hand, it is generally accepted that Altaic **d-* > Turkic **j-*. Elsewhere I tried to demonstrate that the initial dentals / affricates of the common Altaic numeral "2" represent regular responses of the proto-Altaic **t-* in a palatalizing environment (Blažek 1997: 45; independently Dolgopolsky p.c.). The modified proto-Altaic reconstruction **töwi* ~ **tüwi* is fully compatible with its Indo-European counterpart.

5.4. It was already F. Bopp (1840) who mentioned a remarkable similarity between the Indo-European "2" and Austronesian **Duwa* or **DewHa* "2"; cf. lastly Dyen 1970: 436, # 35.

The comparison appears to be really suggestive, but it is quite unique within the set of hopeless parallels collected by Dyen (l.c.).

5.5. The same can be said about the comparison of the Indo-European "2" and Ainu *tu* "2" (Naert 1958: §129). Among various attempts to classify the isolated Ainu language, the solution of Gjerdman (1926) comparing the Ainu with Austronesian and Austro-Asiatic languages appears to be the most hopeful. From this point of view it is natural to connect Ainu *tu* and Austronesian **Duwa* "2" (Gjerdman 1926: 63).

5.6. Sino-Tibetan **Tŭr* "pair" > Archaic Chinese **d̲ur* "each (of a pair)", Written Tibetan *dor* "a pair (of draught cattle)" (Peiros & Starostin 1996: 182,

672), cf. further Sbalti *dor* "a pair, couple (of things)", Magari *nis-tor* "pair" (*nis* "2") and without the final *-r* Written Tibetan *do* "a pair, a couple", Maru *dau* "to be like, resemble" etc. (Shafer 1963: 34–35 comparing Sino-Tibetan & Indo-European).

5.7. Reinterpreting the Indo-European "2" according to the glottal theory (**d-* = **t'-*), Knobloch (1995: 382) sought a cognate in Cherkes (= Adyghean) *t'ū* "2". He opined that it represents a durative participle of the verb *t'ə-n* "spalten".

Adyghean and Kabardean *t'ə* (sic) "2" with closest cognates in Ubykh *tq"a* and Abkhaz *ʃ"-bá* id. are inherited from West Caucasian **tqI:"A* "2", which together with the East Caucasian counterparts, e.g. Avar *ḳi-go*, Ginukh *q̇ono*, Tabasaran *q̇Iu*, Khinalug *ḳu* etc., are derivable from North Caucasian **(t)q̇Hwā̄* "2" (NCED 924). It is evident that the direct relationship proposed by Knobloch is improbable. Starostin (1989: 121, # 180) offers a solution shifting the relationship of the Indo-European and North Caucasian numeral "2" to the hypothetical genetic unity of the predecessors of the Indo-European and North Caucasian proto-languages, i.e. the proto-languages of the Nostratic and Sino-Caucasian macro-families respectively.

§4. Conclusion

1. The bare root of the numeral "2" was probably only **du*. First it was extended by 'the dual collective' in **-u-* (Adams 1991: 20). The second extension has supposed to express the gender distinction: m.(-n.) **duw-o*, originally perhaps with an individual meaning, vs. f. **duw-eH₂*, originally perhaps with a collective function. The third extension had to emphasize duality: m. **duwo-H₁* or only **duwō* (?), obl. **d(u)w-oy-*, n. **duwo-iH₁* , f. **duw-eH₂-iH₁*. The facultative final **-u* appearing in nom. du. m. of *o*-stems can again represent the 'dual collective' proposed by Adams l.c., perhaps when the 'first' **-u-* lost this function and merged with the root of the numeral.

2. Alternatively, the analysis can be based on the oblique stem **d(u)woy-*. Erhart (1982: 139 and p.c.1997) assumed an identity of the segment **-oy-* (**H₃Al* in his reconstruction) and the root of the numeral "1", namely **(H)oy-* (extended in *-no-/-wo-/-ko-*), proposing that the primary meaning was **"one of two". If this starting point is acceptable, the numeral "2" could be analyzed **du-(u)-(H)oy-* "the second of two". In further development **duwoy-* was determined by the dual marker **-H₁* and finally perhaps under the influence of the facultative 'dual collective' **d(u)woyH₁u*, contracted in **d(u)wōu*. Analyzing the inconsistence of the dual inflection of *o*-stems, Georgiev (1973: 48) derived the puzzling masculine ending **-ōw < *-ow? < *-oy?* (*? = H₁*), with *-w-* under the influence of gen.-loc. du. in **-ow(s)*. The parallel ending **-ō* had to be created after the nom. pl. in **-ōs < *-o-es*.

3. None of the internal etymologies presented in §3.1–4 can be accepted. Among the external parallels only Altaic **töwi ~ *tüwi* "2" (usually extended by the dual or collective ending **-ăr̆*) appears to be a safe cognate inherited from a common source: Nostratic **tu* or **tuwi* (Starostin l.c. reconstructed

**tuʔV*, Dolgopolski p.c. **tüʔ[o]*, but the Semitic parallel with **-ʔ-* cannot be taken in account). On the other hand, the dual inflection in Afroasiatic, namely the Semitic dual endings nom. **-ā* vs. obl. **-ay* (cf. also the parallel plural ending **-ay* in Semitic – see Brockelmann 1908: 453–54), and the plural marker **-ū-* forming the dual stem together with the dual ending (Egyptian), correspond suggestively with their Indo-European counterparts including even the order: Indo-European obl. **du-w-oy-* (= "2" + 'COLLECTIVE' + DUAL or "one of two") = Egyptian **siny-ū-āy* (= "2" + PLURAL + DUAL).

Like the discrepancy in the dual endings of the masculine *o*-stems in Indo-European the difference nom. du. **-ā* vs. obl. du. **-ay* in Semitic (Arabic) should also be explained. Vycichl (1957: 359–60) offers the following solution: nom. du. *-ā* < **-āy-u*, acc.-gen. du. *-ay* < **-āy-i*. Besides the external comparison (Egyptian, Hausa; Zaborski 1992: 429 added Beja) he found a support for his reconstruction in such examples where **-āy* was preserved also in the nom. du. in Semitic: Medieval Arabic (office language) *ṯulṯāy* "$^2/_3$", *ḫumsāy* "$^2/_5$" and further Qatabanian *sm-y* "both they" vs. *sm* "they", Sabaic *hm-y* vs. *hm* id., but Arabic *hum-ā* vs. *hum* id.

If the alternative analysis of the Indo-European numeral "2" presented in §4.2. and Vycichl's proto-Semitic dual paradigm are correct, the paralelism in formation of the numeral "2" between Semitic/Afroasiatic and Indo-European is more than suggestive.

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INDO-EUROPEAN "three"

§1. The numeral "three" is well documented in all Indo-European branches including 'Restsprachen'. The most important forms can be projected into the following partial reconstructions, allowing their deeper analysis:

Indo-Iranian:

**tréy-es* "3" m. > Old Indic nom. *tráyas* "3" and *tráyo-daśa* "13", Pali *tayo*, Lahnda of Khetrani *trē*, Sindhi *ṭrē*, Panjabi *tare*, Old Sinhalese *te*, Waigali *trē*, Shina *ṣē* etc. "3", besides forms with length as Buddhist Sanskrit *trāyastriṁśa-* "33", Lahnda *trāe*, *trai*, Panjabi of Bhateali *trai*, Dameli *trâ*, Torwali *ṣā* etc. and Iranian **θrāyah* "3" > Avestan *θrāiiō* besides *θraiias-ča* (cf. *čaθβārō* vs. *čaθβaras-ča* "4"), Khotanese *drai*, Pashto *dre*, Wakhi *trūi*, Yaghnobi *tiray*, Sogdian *'δry* = **ᵊθrē*, Ossetic *(æ)rtæ*, Khwarezmian *šy*, Parthian *hry* = **hrē*, Middle Persian (Turfan) *sh* = **sē*, Modern Persian *sih*, Baluchi *sai* etc., besides Pashto *dyárlas*, Middle & Modern Persian *sēzdah* "13"; cf. also preclassical (Kāṭhaka-Saṁhitā) gen. *tráyāṇām*, Avestan *θraiiąm* "3" (orig. **tréy-ŏm*).

tri-* in oblique cases: acc. **trí-ns* > Old Indic *tríṁ*, Avestan *θriš*, loc.tri-sú* > Old Indic *triṣú*, instr. **tri-bʰis* > Old Indic *tribhíṣ* etc. besides compounds as Old Indic *tri-pád-* "dreifüssig", Avestan *θri-paδa-* "drei Fusslängen", Pashto *dərbalaī* "tripod" etc., cf. also Mitanni-Aryan *ti-e-ru-u-ur-ta-an-na* = **tri-vartana-* "Dreier-Runde".

**tri-H₂* "3" n. > Old Indic (only RV, ŚB) *trí*, later *tríṇi*, but Ashoka *tī* (Girnar); Avestan *θrī*; Middle & Modern Indo-Aryan forms are mostly based on the form *tríṇi*: Pali *tīṇi*, Prakrit *tiṇṇi*, Old Gujarati *triṇṇi*, Panjabi *tinn*, Hindi *tīn* etc.

**tri-sr-* "3" f. > Indo-Iranian **tisr-* > Old Indic nom.-acc. *tisrās*, loc. *tiṣṛ̥ṣu*, instr. *tiṣṛ̥bhiṣ* etc., Pali *tisso*; Avestan nom. *tišrō*, gen. *tišrąm*; Avestan *tišrō sata* "300" corresponds to Middle Persian (Turfan) *tyryst* or *tylyst*, early Modern Persian *tīrist* and maybe Pashto *tēr sū*.

**tri-s* "three times" > Old Indic *trís*; Avestan *θriš*; cf. *θrišuua-* "third", Old Persian **çišuwa-* id.

triH₂-(d)ḱont-* "30" > Indo-Iranian **trī-ćant-* > Avestan *θrisąs* (θrī-śant-s*) besides the forms remodelled according to **ćatam* "100": Old Indic *triṁśát-* f. (*-ṁ-* according to *viṁśatí-* "20"), Pali *tiṁsa(ti)-*, Prakrit *tīsaṁ*, *tīsā*, *tīsaïṁ*, Hindi, Marathi *tīs*, Panjabi *tīh*, Gujarati *t(r)īś*, Bengali *tris* etc.; the same nasal insertion can be recognized in the 'shepherds' dialect of Ossetic: Digor *ærtin*, Iron *ærtyn*, if they continue **θrinsat-* (Abaev II: 427–28); Avestan nom.-acc.

n. *θrisatəm* of *θrisata-* attested in *°θβəm* "thirty times", *°.gāiia-* "a length of thirty paces"; the earlier athematic form is preserved in *θrisaθ-βaṇt-* "thirtyfold" and continues in the middle and perhaps modern Iranian languages: Khotanese *därsä* < **dīrsä* (by analogy with *bästä* "20" < **bīstä*) < **drīsä* < **θrīsat-*, Manichean Sogdian & Khwarezmian *šys*, Zoroastrian Pahlavi & Middle Persian (Turfan) *syh*, Modern Persian *sī*, Parthian *hryst*, Parachi *šus*, Ormuri *ṣīstu*, Sanglichi *rɔs* etc.

**treyo-* or **troyo-* "threefold" > Old Indic *trayá-*, Avestan *θrāyō* id.; Ossetic Iron *ⁿrtæjæ* "in threes".

tr̥-tĭyo-* "3rd" > Old Indic *tr̥tī́ya-*, Pali *tatiya-*, Prakrit *taïa*, *tiijja*, Punjabi *tī (j)ā*, Hindi *tījā* etc. besides Ardha-Magadhi *tacca-* (tr̥tya-*); cf. also Waigali *átəŕ* "übermorgen" (**ā-tr̥ta-* ?) or Ashkun, Kati *nutrī́* "vorgestern" (**anutr̥tīyam*).

tri-tĭyo-* "3rd" > Iranian **θritĭya-* > Avestan *θritiia-*, Buddhist Sogdian *'šty-*, *'tδrty-*, *čšty-*, Manichean Sogdian *(')štyk*, Middle Persian (Turfan) *sdyg*, Parthian *hrdyg* (θritĭyaka-*), cf. Khwarezmian fraction *'rcy 'd(y)k* "third part" (**θritĭ* [*ya*]*-yātaka-*) and Avestan *θritīm* "three times", Old Persian *çitiym* "zum dritten mal".

**tri-to-* "3rd" > Iranian **θrita-* > Khotanese *dädda-*, Tumshuq *dritana-*, cf. Avestan proper names *Θrita-* and *Θritī-* (= Zarathuštra's second daughter, i.e. his third child) and maybe the Rgvedic deity *Tritá-*, although it has been explained as a shortened form for **tri-tavana-* *"of triple strength" comparable with Avestan *Θraētaona-*, son of *Āθβiia-*, corresponding to *Āptyá-*, the epithet of *Tritá-* (EWAI I: 680–81).

(Berger 1986: 27–28, 37, 59–60; Emmerick 1992a: 166–67, 179–80 and 1992b: 293–95, 306–08, 321; EWAI I: 664–665, 675–78)

Anatolian:

tréy-es* (or **tery-és* ?) > Hittite nom. **3-(i)-e-eš, cf. gen. in *te-ri-ia-aš* UD-*aš* "(a distance) of three days". Dat. **3-ta-aš** reflects the *-nt*-stem, appearing probably also in Hieroglyphic Luwian **t(a)riⁿzĭ* (Meriggi 1962: 164 and 1967: 136; his transcription **III-i-(a)** has to be changed in **III-zi(-i)** in agreement with the contemporary development of our knowledge – see Hawkins, Morpurgo-Davies & Neumann 1974: 50 or Werner 1991: 76, 80; Eichner 1992: 67 offered the reading **t(a)riⁿza(/i)*, mentioning that the phonetic value of the sign **III** is not only *tar*, but also *tara* and *tari* – see Werner 1991: 82). Lycian possessive adj. *terihe* "of a third" contains a gen. sg. ending **-so* (Melchert 1994: 324; Hajnal 1995: 73). There is a remarkable derivative of the Anatolian numeral **teri-* "3" in Hieroglyphic Luwian *tariwana-*, the epithet of a ruler interpreted as "righteous judge", i.e. "impartial person, arbitrator", etymologically "the third" (cf. Russian *tretij* "3rd", used also in the sense "arbiter, judge"), extended by the same suffix as Hittite *hanniltawan(a)-* denoting both the litigators before a court and *kutruwan-* "witness", orig. perhaps "the fourth one" (Eichner 1992: 80–81).

**t(e)ri-(y)o-* "3rd" > Anatolian **teriya-* > Hittite *teriya-* in *nu a-pa-a-aš te-ri-aš-mi-iš = nu apās terias-smis* "that one is their third" (KBo XVI 49 IV 2') and its derivatives in **-(o)no-* as adv. *teriyanna* "at/for the third time" or in **-(o)lo-* as *teriyala-* "mediator" = "third [person]".

t(e)ri-su* "thrice" > Hieroglyphic Luwian *tar(a/i)-su-u = *t(a)risû* "thrice" or "three times" (Meriggi 1962: 165 and 1967: 28 with tab. N°. 10: A 6), Lycian B (= Milyan) *trisu* "thrice" (Melchert 1993a: 126); cf. also Luwian distributive **3-*šu* (Melchert 1993b: 298). Eichner 1992: 61, 74, 93 derives the termination **-su* from **-s-wé*, determining here an endingless loc.

t(e)ri-* in compounds: Lycian *tri-sñne/i-* "three-year-old" (cf. Hittite *zēna-* "autumn" – Oettinger 1994: 323, fn. 71 & 72 and Melchert 1994: 315 – both after Neumann) and Lycian B *trpplẽ* "thrice" or "threefold" (tri-p(e)lom*, cf. *tbiplẽ* "twofold, double" < **dwi-p(e)lom*). The meaning "threefold" of Lycian *trppeme* remains uncertain (Melchert 1993a: 79).

**tr̥-yo-* > Hittite (or Luwian – see Melchert 1993b: 298; Eichner 1992: 71–72 preferred a protoform **teryo-* in the case of Luwian) *tarriyanalli-* "of the third rank, be found in the third place; of third quality". Cf. also Hittite *tariyala-* "a drink consisting of three ingredients".

(Eichner 1992: 64–74; Laroche 1992: 356; Shevoroshkin 1979: 183–87; Tischler III: 320–28)

Armenian:

**trey-es* "3" m. > Armenian nom. *erek'* (*e-* is prothetic).

tri-* in oblique cases as acc. *eris* (trins*); in compounds as *eric's* "three times, for the third time" (**trisko-*), *eream* "three year old" (**tri-somHo-*), *errord* "3rd" (**erir-ord* < **tris & k*^{w}*ort-*).

tri-s* > Armenian *erir* "3rd" (s* > Armenian *r* after **r, *u, *i*, cf. *erat'iw* "consisting of three numbers", *erānun* "having three names" with *-r̄-* < **-rs-*).

**triH_2-dḱontH_2* "30" > **tria-ḱonta* > **eria-sonta* > Armenian *eresown*.

(Kortlandt 1994: 253, 255; Meillet 1936: 164–65; Winter 1992c: 349, 351, 355–58)

Phrygian:

**tri-* in compounds: *θρίαμβος* "Kulttanz in Dionyskult" < **tri-ang*^{w}*os* "three-step", cf. *ἴαμβος* and *διθύραμβος* "one-step" and "four-step" resp. (Haas 1966: 158, 164–65).

Greek:

**trey-es* "3" m. > Attic-Ionian *τρεῖς*, Doric (Thera) *τρῆς*, Cretan (Gortys) *τρέες* "3" m.-f.

**tri-* in oblique cases: acc. **tri-ns* > *τρῖς*, Cretan (Gortys) *τρίνς*, gen. **tri-om* > *τριῶν*, dat. *τρισί* = Mycenaean *ti-ri-si* etc. besides compounds as *τρίπους* = Mycenaean *ti-ri-po* "tripod" etc.

**tri-H_2* "3" n. > Greek *τρία*.

**tri-s* > Greek *τρίς* "three times", cf. Mycenaean *ti-ri-se-ro-e* = dat. *Τριστ(h)ήρωηει* the name of a (semi-)divine being, lit. "Thrice-lord". The other extensions are unambiguous, e.g. *θρῖναξ* "trident" < **trisn-ak̑-* *"with three points" (Kretschmer) or *θρῖον* "leaf of fig" < **triswo-* (Sommer; cf. Frisk I: 684–86).

**triH₂-dk̑ontH₂* "30" > **tria?konta* > Greek *τριᾶκοντα*, Ionian *τριήκοντα* (Coleman 1992: 433, fn. 16 mentioned Latin neuter *triā* "3" as a parallel to *τριᾱ́-* < **tri-eH₂-*).

**tri-to-* "3rd" > Greek *τρίτος* (but Lesbian *τέρτος* and the Hesychius' gloss *τέρτα · ἡ τρίτη* ; Homeric *τρίτατος* represents an evident infuence of *τέτρατος* & *τέταρτος* "4th", *ἔνατος* "9th", *δέκατος* "10th"), probably already in Mycenaean proper names: *Ti-ri-to* 'man's name'

(Kn Dv 1386) = *Τρίτος* or *Τρίτων*, *Ti-ri-to* 'place name' (KN Da 1238, Db 1232; cf. *Τρίτα*, old name of Knossos), *Ti-ri-ti-jo/-ja* 'ethnic adj.' (KN 88) etc. (Chadwick 1973: 586).

**tre-* ? > Boeotian *τρέ-πεδδα* (Brugmann 1892: 470).

(Chantraine 1977: 1131; Schwyzer 1939: 589, 592, 595; Waanders 1992: 371, 375, 379, 385)

Thracian:

**tri-* in compounds, e.g. personal name *Τρι-κεντιος*, probably "[having] three children", tribal name *Τρι-βαλλοί* etc. (Detschew 1957: 522–27; Georgiev 1977: 84).

Illyrian:

**tri-* "3" in compounds: personal name *Τρι-τεύτα* f. 'name of chieftain, mother of the king Pinnes', lit. "(of) three tribes", the place name *Tri-bulium* = Greek *Τρι-φυλία* etc.; cf. also Messapic potamonym *tri-gonošoa* "[river] with three curves" ?

**tri-to-* "3rd" in personal names: *Trita-nerus* ("the third man/hero"), *Τριτύ-μαλλος* etc. (Krahe 1955: 55, 61, 102, 104, 107).

Albanian:

**trey-es* "3" m. > **trees* > common Albanian *tre* m. (so e.g. Buzuku 1555; Blanchus 1635).

**tri-H₂* "3" n. > **tri* + f.pl. **-ā(s)* > **trië* > common Albanian *trī* f. (e.g. Buzuku 1555 *trii*, *trij*; Blanchus 1635: *trij*)

? **tri-sr-es* "3" f. > **tisres* > **tīres* > **tir* > **tir-´* > **tër-´* in compounds as *terfoiene* "trifolium" (Blanchus 1635) or Tosk (Barile) *tr̄dʒít* "3" (= "3 tens") (Hamp 1992: 876–77, 907).

**tret(y)o-* "3rd" > common Albanian **tret-* (e.g. Buzuku 1555 *hi treti*; Blanchus 1635 *i treti*); Hamp (1992: 907) also accepts alternative derivations from **tr̥t(y)o-* > **trit-* > **tret-* or from a feminine **tritā* > **tretā* > **tret-*.

(Hamp 1992: 906–07; Huld 1984: 117).

Venetic:

**tri-* in compounds: *Tribus.iiati.n* 'theonymical epithet' (e.g. from Lagole), a derivative in **-āti-* from **Tribus.iio-* (Lejeune 1974: 85, 102, 280).

Italic:

**trey-es* "3" m. > Latin *trēs* m.-f., Oscan *trís* f.

tri-* "3" in oblique cases: acc. m.-f. **tri-ns* > Latin *trīs*, Umbrian *trif, tref, tre*, gen. m.-n. **tri(y)-om* > Latin *trium*, dat.-abl. m.-n. **tri-bʰos* > Latin *tribus*, Umbrian **trifos* > **trifs* > *tris* besides such compounds as Latin *triplex, triplus* "threefold", Umbrian abl. pl. m. *tripler* or Latin *tribus* "tribe", Umbrian gen. sg. *trifor* (tri-bʰu-* *"consisting of three parts", cf. Umbrian acc. sg. *difue* "double, in two parts") etc.

tri-eH₂* "3" n. > Latin *triā* "3" n. (-ā* from the thematic paradigm ? – but cf. Greek *τριᾰ́-* in *τριᾰ́κοντα* "30" – see Coleman 1992: 432–433), Umbrian *triia* id. besides

**triH₂-dk̑ṇteH₂* "30" > **trī-gentā* > Latin *trīgintā*.

**tri-s* "thrice" > **ters* > Latin *terr* (Pl. *Ba.* 1127) > *ter*.

**trisno-* > Latin *trīnus* "threefold", while *ternī* "three each" can reflect simply **tri-no-*.

**tri-tyo-* "3rd" > **tertio-* > Latin *tertius*, Preneste *Trtia*, Umbrian *tertiama*, cf. *terti(m)* "a third time" < **tertiom* (n. acc. sg. of the ordinal), cf. Latin *tertium*.

**tri-stH₂o-/-stH₂i-* "the third standing by" > Oscan *trstus* "teṣtēs", *trístaamentud* "testāmentō", Latin *testis* "witness", lit. "standing as the third person to the disputans" (cf. Russian *tretij* "3rd", used also in the sense "arbiter, judge").

(Coleman 1992: 393, 400, 409–10, 416, 423; WH II: 676–77, 702–08)

? Lusitanian:

**tri-to-* "3rd" in the personal name *Tritaius* (Schmoll 1959: 47). The agreement with *Pintaius*, probably a derivative of "5", indicates more probably a Lusitanian rather than Gaulish origin, cf. the Gaulish ordinal **pinpeto-* "5th". In the case of other Old Hispanian proper names derived from the Indo-Europen numeral "3" (e.g. *Tirdaius, Tritalicum, Tirtalico, Tirtanoš* etc. – see Schmoll l.c.), it is difficult to determine the Lusitanian, Celtiberian or Gaulish origin.

Celtic:

**tri-* in oblique cases: acc. m. **tri-ns* > Celtic **trīs* > Hispano-Celtic (Botorrita) *tiriś* = **trīs*; Old Irish nom.-acc. m. *trí h* (the form **tre h-* quoted by Watkins in *Ériu* 18[1967]: 97 as a continuant of an expected nom. **treyes* does not exist), Old Welsh *tri*; gen. m.-n. **triy-om* > Goidelic **triyan* > Ogam *TRIA*, Old Irish *tre*^{N}; dat. m.-n. **tri-bʰis* > Goidelic **trib* > Old Irish m.-n. dat. *trib*.

**tri-H₂* "3" nom.-acc. n. > Celtic **trī* > Old Irish *trí* (or an influence of m. ?), but the seventh-century Cambrai's *tre* indicates **treya* < **triy-ā* (cf. Latin *triā*).

t(r)éy-sōr nom./ *t(r)i-sr-ĝs* acc. "3" f. > Insular Celtic **tēsūr(-es) / *tēsur-ās* > Old Irish *teüir, téoir / téora h-*; Middle Welsh, Breton *teir*, Cornish *ter, tyr*; Gaulish (La Graufesenque) *tidres* = **tiđres* < **tisres* (Thurneysen *ZCP* 15[1925]: 380; cf. Lambert 1994: 144).

**triH₂-(d)ḱonts* > Celtic **trīkonts* > Gaulish-Latin (Gélignieux) dat. *trĪcontis omnibus* "in all [months] with 30 [days]" (*CIL* 13: 2494) and **trioconto-* reconstructed on the basis of the abbreviation *TIOCO-* used in the Coligny Calendar (Olmsted 1988: 294); Old Breton *tricont*, Middle Breton *tregont* (*e* < *i* < **ĭ* after the ordinal *trede*); Old Irish *trícho, -a*, acc. *trichait*, gen. *tríchot, -at.*

tri[s]no-* > Celtic **trianon* (Pokorny 1959: 1092) "a third" > Old Irish *triän*, Old Welsh *trean*; Gaulish (La Graufesenque) acc. pl. *trianis* (trianins*) "thirds" (a measure of capacity) (Thurneysen, *ZCP* 15 [1925]: 350–51; Lambert 1994: 144). Greene (1992: 521) would like to derive it from **triy-ono-*, a form compatible with Hittite *teriyanna-* "at / for the third time". But he admits that the Celtic **-a-* remains problematic.

**tri-* in compounds: Hispano-Celtic (Botorrita) *tiri-* = **tri-* in *tiricantam* = **tri-kantām* "territory", lit. "Dreiländereck" (Meid 1993: 120); Gaulish *tri-* in *trinanto* "three valleys" (Endlicher's glossar – see Lambert 1994: 203), *TRINO & TRINVX* (Coligny Calendar) restored in **tritio-noux* "the third night" by Olmsted (1988: 293) or **trino[xtion]*, **trinux[tion]* "[fest] of three nights" by Billy (1993: 148); further *TRIC-IOMO-* (Coligny Calendar) restored in **trideciomo-* "13th" (Olmsted 188: 294–95 derives it from **trés-dek-omo-*); Breton *trywyr* "three men"; Old Irish *trían* "three persons" < **tri-wirom* etc.

**tri-to-* "3rd" > Gaulish names as *Tritos*, *Tritus*, *Trita* etc. (Billy 1993: 148) and Hispano-Celtic personal names (rock inscription of Ibiza) *Tiŕtanos*, *Tiŕtu* (Schmidt 1992: 48).

**tri-tiyo-* "3rd" > Gaulish (La Graufesenque, Coligny Calendar) **tr[it(i)os]* and **tri[tio-]* resp., restored after personal names, e.g. *Tritius* (*CIL* 13: 1683), *Trittia* 'a goddess' (*CIL* 12: 255), Old Welsh *tritid*, Welsh *trydydd*, Breton *trede.*

tri-stH₂o-/-stH₂i-* ? "the third standing by" > Old Irish *tres(s)*, *tris(s)* resp., dat. sg. *triuss* "3rd", cf. Latin *testis* (tristis*) and Oscan *trstus* "witness", orig. "the third standing by".

(Eska 1989: 111; Hirunuma 1988: 40; Greene 1992: 507–08, 511, 515, 539, 542; McCone 1993:53–73; Meid 1993: 121; Schmidt 1992: 48–49; Thurneysen 1946: 242–50; Vendryes 1978: T-139–44)

Germanic:

trey-es* "3" m. > Proto-Germanic nom. m.þriyiz* > Common Germanic **þrīz* > Icelandic *þrír*, Runic Danish *þrīR*, Old Swedish *þrī (r)*, Old High German *drî*, Modern High German *drei*, Dutch dial. *drij*, with adj. ending Old Saxon *thria*, Dutch *drie*, modified in early West Saxon *þrīe* and Old English *þrīo.*

**tri-* in oblique cases: acc. m. **þrins* > Gothic m.-f. *þrins*, but Old Icelandic m. *þré* vs. Old Norwegian f. *þréar* etc., gen. **þrijō* > Gothic *þrije* (*-e* after gen. *twaddje* "2"), Old Swedish *þrigjja*, Old High German *thriio & drîo* etc. and nom.-acc. f. **þrijōz* > Northwest Germanic (Tune, Norway, 400 AD) *þrijoz*, Icelandic *þrjár*, Old Saxon *threa*, Old High German *drio* etc.

**tri-eH₂* nom.-acc. n. > **tri(y)ā* > Germanic nom.-acc. n. **þrijō* > Gothic *þrija* & Crimean Gothic *tria*, Icelandic *þrjú* (but Old Icelandic *þrjó*), Modern Norwegian *trju*, Old Swedish *þrȳ* etc., Old Frisian *thriu*, Old English *þrīo & þrēo*, Old Saxon *thriu*, *thrio*, *thria*, Old High German *driu* etc.

**trisnó-* > Germanic **þrizna-* > Old Icelandic *þrinnr* "triple", Modern Norwegian *trinn* "threefold" etc.

**tris-* extended in Old Icelandic *þrisuar*, Old Norwegian *þrysuár*, Old High German *driror* "thrice". It can reflect a compound **tris- & *wēro* – (cf. Old Indic *pañca-vāram* "five times"), how e.g. Loewe thought. It is parallel with Old Icelandic *tysuar* "twice", but not with Old High Germanic *zwiro* "twice" reflecting Germanic **twizwaus* < gen. loc. du. **dwis-wóus*. Although the dual ending makes sense only with "twice", the influence of "thrice" is quite natural (Ross & Berns 1992: 648–50).

**tri-tyo-* "3rd" > Germanic **þriðja-* > Gothic *þridja* (and Crimean Gothic *treithyen* "30" ?), Old Icelandic *þriþe*, Old Saxon *thriddio*, Old Frisian *thredda*, Old English *þridda*, Old High German *drit(t)io* etc. Peeters (1983: 202–03) proposed an alternative stem formation reconstructing **þriðjō*. The numeral "30" represents an innovation in Germanic in confrontation with the preceding branches. Gothic acc. *þrins tiguns &* gen. *þrije tigiwe* and Old Icelandic *þrír tiger* and West Germanic **þrī-tegu-* > Old Saxon *thrîtig*, Old Frisian *t(h)rîtich*, Old English *þritig*, Old High German *drîz(z)ug* etc. consist of the numeral "3" and the form **tegu-*, a secondary *u*-stem usually explained as a back formation to the dat. n. **tegum(m-)* < **tegunðm-* < **dek̑ɡt-m°*.

(Lehmann 1986: 365–66; Mironov 1963: 351, 383, 384, 394–96; Ross & Berns 1992: 575–77, 613–14, 626)

Balto-Slavic:

**trey-es* "3" m. > Balto-Slavic **trijes* (heterosyllabic **-ey-* gives **-ij-* regularly only in Slavic; in Baltic an influence of the zero grade **tri-* or neuter **trī* must be supposed) > Lithuanian *trỹs*, Latvian *trîs*, Yatwingian *trif* (Zinkevičius 1984: 19); ? Prussian **tris* probably appearing in the place-name *Triskaym*; Slavic **trьje* m. > Old Church Slavonic *trije*, Slovenian *trijê*, Old Slovak *tré*, Old Czech *tři*e, Upper Sorbian *tř̌o*, Lower Sorbian *tśo*, Polabian *tări* = **tьre* (cf. *dăvo* "2"), Old Polish *trze*, Old Russian *trie*; in other Slavic languages the gender distinction m. **trьje* vs. f.-n. **tri* is lost. Nom. f. **tri* is originally an acc., while the original nom. was like the nom. m. The original vocalization is preserved in Prussian gen. **treon*, attested in the place-name *Treonkaymynweysigis* "trium villarum pratum" (cf. the Indo-Iranian gen. **treyŏm* also in full grade).

**tri-* in oblique cases: acc. **tri-ns* > Lithuanian *trìs*, Latvian *trîs* (merged with nom.), Common Slavic **tri*; loc. **tri-su* > Lithuanian dial. *trisù*; Old Church Slavonic *trьxъ* etc.

**tri-* in compounds: Lithuanian *trìgubas*, Russian Church Slavonic *trьgubъ* "threefold" etc.

**tri-H_2* n. > Balto-Slavic **trī* > Slavic f.-n. **tri* > Old Church Slavonic *tri*, Slovenian *trî*, Old Czech and Upper Sorbian *tři*, Lower Sorbian *tśi*, Old Russian *tri*; merging with contracted m. **trьje*, in most modern languages the form **tri* is generalized: Bulgarian & Macedonian *tri*, Serbo-Croatian *trî*, Slovak *tri*, Czech *tři*, Polish *trzy*, Ukrainian & Byelorussian *try*, Russian *tri*. In Baltic a regular continuant appears in Lithuanian *trý-lika* "13".

**treyo-* "3" (collective) > Balto-Slavic **treja-* > Lithuanian m. *treji*, f. *trẽjos* pl. "3", the old neuter is preserved in *trẽja tíek* "dreimal so viel", Latvian m. *treji*, f. *trejas*; Old Church Slavonic m. pl. *troji*, Old Russian m. *troji*, n. *troje*. In the *o*-vocalization an influence of collectives **oboje*, **dъvoje* was seen (Smoczyński 1989: 63). Comrie (1992: 808) speculated about an ablaut variant here.

**tr̥-tiyo-* "3rd" > Baltic **tirtija-* (Trautmann 1923: 328) or, accepting metathesis, **tri-tiyo-* > Baltic **tritija-* (Smoczyński 1989: 65) > Prussian nom. m. *tirt(i)s*, *tīrts*, acc. m. *tīrtin*, nom. f. *tirti*, acc. f. *tīrt(i)an*, *tirti(e)n*.

**tre-tiyo-* "3rd" > Lithuanian *trẽčias*, Latvian *treș̌s*; Slavic **tretьjь* indef. & **tretьjьjь* def. > Old Church Slavonic *tretii* & *tretьii* resp. Vaillant (1958: 654) assumed a substitution *i* → *e* under the influence of the collective attested in Lithuanian *trejì*. Smoczyński (1989: 64) derived the isolated **tre-tiyo-* (but cf. Albanian **tret-* "3rd" < **tret(y)o-*) from (also isolated !) **trei-tiyo-*. On the other hand, Porzig (1954: 203) thought that the forms in **tre-* represent a peripheral archaism.

Besides Germanic the Balto-Slavic numeral "30" is also represented by innovations in confrontation with other branches: Lithuanian *trìsdešimt* (juxtaposited indeclinables), earlier *trỹs dẽšimtys* (nom. pl. m. + nom.-acc. pl. f.), Latvian *trîsdesmit* (with indeclinable *-desmit* besides *-desmits* in dialects, which can be declined); Old Church Slavonic *trideseti* represents an acc., while the expected nom. would be **trije deseti* < **trьje deseti* (nom. m. + nom. pl. of the consonant declension).

(Comrie 1992: 737–41, 772–75; Fraenkel 1962–65: 1114–16, 1125; Smoczyński 1989: 62–66, 94–95; Vaillant 1958: 626–27, 654–55)

Tocharian:

**troy-es* "3" (orig. collective) > Common Tocharian **treyə* > Tocharian m. A *tre*, B *trai*

**tri-H_2* "3" n. > Common Tocharian **təry̆a* > Tocharian f. A *tri* (*täryā-*), B *tarya* (*täryā-*).

**triH_2-(d)k̂n̥tH$_2$* (Winter) or *-(d)k̂onts* > **triyakōs* (Klingenschmitt 1994: 404 and fn. 159) > Common Tocharian **təryaka* "30" > Tocharian B *täryāka*;

A *taryāk* instead of expected **täryāk(V)* originated under the influence of *śtwarāk* "40".

The ordinal attested in A *trit* and B *trite & trīte* cannot be directly derived from **tri-to-* (so Van Windekens 1976: 514; contra Winter 1992b: 135–36); more probably it represents a transformation of a hypothetical primary ordinal **triy-o-* on the model of **dwi-to-* (Hilmarsson 1986: 325).

(Hilmarsson 1986: 325, 329, 337; Van Windekens 1976: 513–14; Winter 1992b: 104–06, 118, 135–36 and 1994: 191).

§2. Reconstruction and internal analysis:

The numeral "3" was inflected as an *i*-stem in plural (Beekes 1995: 212), distinguishing gender:

m.: nom. **treyes*, acc. **trins*, gen. **treyom*, loc. **trisu* etc.

n.: nom.-acc. **tri-H_2*, in some dialects innovated in **tri-eH_2*.

The feminine represents a compound of the forms **trey-/*tri-* "3" and **H_1ésōr*, gen. **H_1srés* "woman" (cf. Oettinger 1986: 116–28), simplified via dissimilation in **téy-sōr / *ti-sr̥-´*.

With the exception of the innovations in Germanic and Balto-Slavic, the numeral "30" was inherited in the form **triH_2-(d)ḱontH_2/-(d)ḱn̥tH_2* or **-(d)ḱonts*.

Further, a collective adjective **treyo-* "triple" and an adverb **tris* "thrice" (orig. perhaps loc. **tri-si/-su* – see Szemerényi 1990: 243) can be reconstructed. The form **trisn(o)-* "triple, threefold" also appears in more branches. It has been usually segmented in **tris-n(o)-*, but the Anatolian evidence permits an alternative solution **tri-sn-*. The 'ideal' ordinal **tri-o-* is directly attested probably only in Anatolian **teriya-*. In other branches it was remodelled under the influence of other ordinals in **tri-to-*, **tr̥-tiyo-* etc.

Benveniste (1962: 86–87) identified the opposition between the bases I (**ter-y-*) and II (**tr-ey-*) in Anatolian **teriya-* vs. **trey-es/*tri-* in other branches, separating the root **ter-*. There is not any unambiguous explanation for the extension in **-i-/-y-*. Fay (1910: 416) assumed a locative origin of it. Carruba (1979: 199) saw here a deictic particle extending "1" (**o-i-*), "2" (**du-i-*) and "3" (**tr-i-*). In **-i-*, Villar (1991: 138f) identified a pronominal plural marker hence **treyes* = **tre* + *i* + *es*, similarly as e.g. the pronoun **wey(e)s* "we" = **we* + *i* + *(e)s*, i.e. 'root' + 'pronominal plural' + 'nominal plural'. On the other hand, the variants **dwō(u)* and **dwoi/*dwei/*dwi* of the numeral "two" have to represent dual and plural respectively (ibid.).

§3. Etymology:

1. Brugmann (1892: 464) thought that **ter-* & **tr-i-* "3" meant originally "middle (= protruding) finger", quoting Old Indic *tár-man-* "the top of the sacrificial post" and Greek τέρθρον "tip, end". This idea was developed by Fay (1910: 416–17), who reconstructed **tri-sthos* (= *-stH_2os*) "tip-finger". In the first component he identified loc. **tr-í-* "on-tip", while the second member

(*"stander") has also to form the other finger names, e.g. Old Indic *aṅguṣṭhá-* "thumb" (Avestan *angušta-* "toe") and *kaniṣṭhá-* "little finger" (usually interpreted as a superlative to *kánīyas* "lesser, younger"). Let us add Lithuanian *pirštas* and Old Church Slavonic *prъstъ* "finger" < **pr̥-stH₂o-* = *"hervorstehend" (Pokorny 1959: 813).

2. Erhart (1970: 99) and Carruba (1979: 199) derived the numeral "3" from the root **terH- / *treH-* (= **terH₂- / *treH₂-*) "to go through, cross, pass" (Old Indic *tárati, tiráti* "crosses over, passes over, overcomes", Latin *intrāre* "to enter", *trāns* "through"), assuming an original meaning "overcoming [the first pair]". This interpretation implies a binary base of counting in the Indo-European proto-language (cf. Erhart 1970: 101–02). The idea deriving "3" from *trāns* etc. was proposed already by Šafařík (1865: 631), who also included here the comparative suffix **-tero-*. Having the same starting point (Old Indic *tirás* "away; beyond, over, through") Lehmann (1991: 135–36 & 1993: 254) postulated the original meaning *"that yonder, even further", in agreement with his interpretation of the numeral "two" = *"that one farther away" based on the root **dew-* "further". He finds a suggestive support in Welsh *trim-uceint* "30", which has to represent "[the decad] beyond 20".

3. Studying the Indo-European model of the tripartite order of the universe and its reflexes in mythology, Toporov (1979: 20) developed the "protruding" etymology of the numeral "3". He admitted the presence of the root **ter-* also in **H₁en-ter* "between" (Pokorny 1959: 313).

4. Fay (1910: 416) proposed an alternative semantic motivation "Reibe-Finger", based on the synonymic root **ter-* "to rub" (Pokorny 1959: 1071).

5. Holmer (1966: 28–29) saw a semantic starting point for the numeral "3" in the verb **terk-/ *tork-* "to turn, wind" (Pokorny 1959: 1077), comparing Basque *(h)iru(i)n* "to spin" vs. *(h)iru(r-)* "3".

6. There are also attempts to find external parallels. E.g. Cuny (1924: 478) speculated about a connection of **tri-* etc. to Semitic **ṯalāṯ-* and Berber **karāḍ* (!) "3". Yet less hopeful is the attempt of Levin (1992: 261, fn. 9) to compare it with Syriac *təreyn* m. "2" (!), in reality dissimiled from **ṯin-ay-ni.*

Returning to the old idea of Bopp, Dyen (1970: 436) compared **tri-* with Austronesian **telu* "3".

§4. Discussion:

Ad 1. There is an excellent parallel in Dravidian **mūṉ-* "3" (DEDR #5052), probably derived from **muṉ-* "before" (DEDR #5020) > Tamil *muṉ* "in front", Toda *mïn* "sharp point, top of hill", Parji *mūni* "tip, point", Brahui *mōn* "front" etc. (Andronov 1978: 241–42).

Ad 2. A formal parallel supporting the idea "three" = "over two" can be found in Welsh *trim-uceint* "30", consisting of *uceint* "20" and the intensive prefix *trim-* (= Irish *trem-*), hence "30" = "super-twenty", cf. Old Irish *mór-śéser* "seven persons", lit. *"big-six persons" (Stokes 1894: 130). On the other hand, the absence of any laryngeal in the root of the numeral "3" excludes the

derivation from the root **terH₂-* / **treH₂-* indicated by the examples quoted by Erhart, Carruba & Lehmann. There is a more hopeful candidate in the bare root **ter-* extended in *-i-* (= loc.?) like the Celtic preposition **trei* "through", continuing in Old Irish *tré, trí, tria* (in contrast to *tar* "beyond, over" < **tr̥H₂os*), Old Welsh *trui* id., besides the intensive particle **tri-* > Gaulish *tri-*, Old Irish *tri-*, Welsh *tri-*, *tre-* (Stokes 1894: 130; Vendryes 1978: T – 125f). From the point of view of functions of this preposition / prefix, a primary semantic motivation could be *"super [-finger]" = "middle finger". In this case the etymologies 1 & 2 are fully compatible.

Ad 3. Brugmann (1911: 178) classified the preposition **H₁en-ter* "between, inside" as an endingless locative. Separating the preposition **H₁en-* "in", we get the root **ter-* forming not only adverbs, but also pronouns and numerals like **kʷo-tero-* "who of two", **H₂en-tero-/*H₂el-tero-* "alter", Greek ἄτερος "one of two" etc. (Brugmann 1906: 326). If **ter-* was originally an independent word, it would be natural to expect a locative **t(e)r-i* with the same meaning as **H₁en-ter*. This account allows us to propose the primary meaning *"[finger] in the middle" for the numeral "3". It is not accidental that most denotations of the "middle finger" are based on its middle position between fingers. The weakness of this etymology consists in a probable compound character of this suffix (cf. Fay 1910: 407).

Ad 4. This idea can be supported by the (only existing) etymology of Common Berber **karāḍ* "3" = "scratching [finger]", cf. Common Berber **k-r-ḍ* "to scratch" > Kabyle (Dallet) *ekṛeḍ*, Tuareg of Ahaggar (Foucauld) *ekreḍ* (Zyhlarz 1950: 408). Cf. also Toporov (1979: 20), finding an interesting support in Slavic folklore (the puzzle based on the identity of Russian *tri* 1) "three"; 2) "rub!").

Ad 5. Holmer finds a support of his etymology in the apparent connection of the verbs *twine & twist* and the numeral *two*. But it is generally accepted that these verbs are derived from the numeral and not vice versa (Hoad 1986: 510–11).

Ad 6. The quoted external parallels are unconvincing for phonetic, structural, historical and geographical reasons.

§5. Conclusion:

Confronting the presented etymologies, I prefer the etymologies 1 & 2 based on the same Indo-European root **ter-* including the locative function of the *i*-extension. The primary semantic starting point could be more probably "protruding [finger]" than "overcoming [two]". The etymologies 3 & 4 appear as less hopeful. The external comparisons (5, 6) cannot be taken seriously at all.

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INDO-EUROPEAN "four"

§1. With exception of Anatolian there is only one inherited denotation of the numeral "4" common for all Indo-European branches. But in Anatolian hopeful traces of this numeral may also be found. The most important forms can be projected into the following partial reconstructions, allowing their deeper analysis:

Indo-Iranian:

**k^{w}etwóres* "4" m. > Old Indic nom. pl. *catvā́ras*, Pali *cattāro*, Sinhalese *satara* (the Modern Indo-Aryan forms as Old Gujarati *cyāri*, Old Hindi, Marathi *cyār*, Hindi *cār*, Old Bengali *ciāri* etc. reflect unattested Middle Indo-Aryan **cayāri*); Kati *čtwō*, Prasun *č$^{(l)}$pū*, Waigali *čatā*, Ashkun *ċatā*; Iranian **čaθwārah* > Avestan nom. pl. *čaθβārō*, Middle Persian (Turfan), Zoroastrian Pahlavi *čh'r*, Modern Persian *čahār*, Kurdic *čavār*, Baluchi *čīār*, Khotanese *tcahora*, Tumshuq *tsahari*, Pashto *calōr*, Sogdian *čtf'r*, Yaghnobi *tifor*, Parthian, Khwarezmian *cf'r*, Ossetic Digor *cuppar*, Iron *cyppar*, Shugni *cafōr*, *cavōr*, Wakhi *cəbūr* etc. The Indo-Iranian long **-ā-* represents probably a consequence of Lex Brugmann, although it could reflect an influence of the neuter (Emmerick 1992b: 296).

**k^{w}éte/osres* "4" f. > Old Indic nom.-acc. pl. *cátasras*; Iranian **čatahrah* > Avestan acc. pl. *čataŋrō*.

**k^{w}etwṓr* "4" n. (= coll.) > Old Indic nom.-acc. pl. *catvā́r-i* (the secondary *-i* < **-H_2* extends the words in **-ōC*, cf. Harðarson 1987: 96–97); Avestan acc. *čatura* follows acc. m. *čaturə*. Old Indic *catvāriṃśát* f. "40" consists probably of ntr. *catvā́ri* "4" & *-śat*, forming also other decads (30, 50) – see Debrunner & Wackernagel 1930: 365. An unexpected nasal appears in "40" and "30" under the influence of *viṃśáti*.

k^{w}etur-/*k^{w}etw̥r-* > Old Indic (m.) acc. pl. *catúras*, instr. pl. *catúrbhiṣ*, gen. pl. *caturṇā́m* and Avestan (m.) acc. pl. *čaturə̄*, gen. pl. *čaturąm*; Old Indic adv. *catúr* "four times" (k^{w}etur-s*), besides Avestan *čaθruš* id. (**k^{w}etw̥r-s*); cf. also the innovated ordinals in Old Indic *caturthá-* (AV), Pali *catuttha*, Prakrit *caüttha*, Hindi *cauth(a)* etc., besides Iranian **čaθruma-* > Khotanese *tcūrama-*, Parthian *čwhrm*, Zoroastrian Pahlavi & Middle Persian (Turfan) *tswm* and fractions attested in Avestan *čaθrušuua-* "quarter", Old Persian **caçušuwa-* > **caçuwa-* id. Prakrit *caürō* and the Dardic forms, like Dumaki *čaur*, Bashkarik *čōr*, Phalura *čūr*, Kashmiri *ċōr*, *ċaur* etc. "4", represent the weak base *catur-*.

**(k^{w})tur(ī)yo-* "4th" > Old Indic *turī́ya-* (RV), *túrīya-* "a quarter" (AV), *turyá-* "consisting of 4 parts" (AV of Paipalāda review) etc.; Kalasha *toríyas*

"three days ago" < **turīya-vāsa-* "the fourth day"; Avestan *tūiriia-* "4th", *ā-xtūirīm* "four times" < **ā-kturīi̯am*, cf. *ā-θritīm* "three times".

**kʷetwr̥H-(d)k̑n̥t-* "40" > Iranian **čaθwǎrsat-* > Avestan nom.-acc. ntr. *čaθβarəsatəm* (the original athematic form is also preserved in *čaθβarəsaθ-βant-* "fortyfold") probably shortened as *čaθβārasča* vs. *čaθβārō* "4"; Khotanese *tcaholsä*, Christian Sogdian *štfrs*, Pashto *calwēšt* "40", Ossetic Digor *cæpporse*, Iron *cyppūrs* "Christmas", lit. "forty-day fast" etc. The West Iranian forms like Zoroastrian Pahlavi *čh(h)l*, Modern Persian *čehel*, Baluchi *čil*, Kurdic (Kurmanji) *čîl* "40" were regarded as continuing a hypothetical Old Persian **čaθwr̥θat-* (Bartholomae, *IF* 42[1924]: 140) or **čaθwarθat-* (Szemerényi 1960: 51–52).

(Abaev I: 322–23; Bailey 1979: 137–38; Beekes 1995: 212; Berger 1986: 28; Emmerick 1992a: 167–68 and 1992b: 295–98, 308–09, 331–32; EWAI I: 526–27, 657; Hoffmann 1965: 251)

Anatolian:

In the Anatolian branch the numeral **kʷetwŏr* "4" was replaced by **méyu-*, continuing in Hittite pl. nom. *mi-e-(ya-)wa-aš*, acc. *mi-e-ú-uš*, gen. *mi-i-ú-wa*[*-aš*] "member of a group of four; four?" (Güterbock 1957: 1–3; Neu 1987: 176–77, 186, fn. 48, 55; Eichner 1992: 76), Luwian *māuwa/i-* in *ma-a-u-wa-(a-)ti pa-*[*a-a*]*r-ta-a-ti* instr. pl. "of / with the four sides", *mawalla/i-* "four-span" (Eichner 1992: 78; Melchert 1993b: 145), Hieroglyphic Luwian **mawiⁿza*, reconstructed according to the record **IIII**-*za* with the sign **IIII** bearing the syllabic value *má/mi* (Eichner 1992: 79; Laroche 1992: 356), ? Lycian dat.-loc. pl. *mupm̃me* "fourfold", cf. *tupm̃me* "twofold" (Shevoroshkin 1979: 183; Melchert 1993a: 44). The etymology of **méyu-* is not unambiguous. The most hopeful solution proposed by Heubeck (1963: 201–02) explains it as a substantivized adjective "little (hand)", derived from the root **mei-* "to lessen" (Pokorny 1959: 711), cf. Greek *μείων*, Mycenaean *me-wi-jo* "less", Gaulish (Chamalières) *meion* "little" or "weak" (Meid 1989: 27), Old Icelandic *mjór* "slim, narrow", Tocharian B *maiwe* "young, little" etc. Lehmann (1991: 137) mentions a suggestive semantic opposition **meyu-* "4" = "less hand" vs. **penkʷe* "5" = "the whole hand" (Polomé). Perhaps a more convincing semantic motivation could be based on "little finger", cf. e.g. Aghu (Papuan language) *sigiane* "4", lit. "little finger" (Gvozdanović, ms. 1995). Ivanov (1980: 21) mentions the subtractive principle forming the numeral "4" in Latin and Lycian scripts, namely **IV**. Hence *"[5] minus [1]"? This semantic motivation is undoubtedly possible, cf. examples from Papuan languages: Kube *kembong kpac*, Tobo *kembem kpagap* "4" = "thumb without" (Smith 1986: 78, 86). Carruba (1979: 195) presented an alternative etymology based on an opposite semantic motivation: he started from the Hittite verb *mai-/miya-* "to grow (up), reach ripeness or maturity, increase, be plentiful, abundant, prosper" (CHD I: 113), interpreting the numeral "4" as "cresciuto, molto". Toporov (1983: 117, 119) added a wider semantic field of relatives, e.g. Anatolian

**muwa-* "power", Latin *mundus* "world" etc. (Hamp 1994–95: 61–62) proposed an intriguing etymology deriving *meyu-* "4" from **meH$_1$-u* "measure". Ivanov (1980: 21) sought a source of the Anatolian numeral "4" in some North Caucasian dialect, cf. Lak *muq̇* "4".

There are also promising traces of **k^{w}etwŏr* in Anatolian. It was A. Torp who first speculated about Lycian *teteri* as an equivalent of **k^{w}etwores*. Later Laroche defined the meaning with more precision in "city". It was confirmed on the basis of a trilingua discovered in 1973 in Xanthos, where the equivalence *teteri* = *πόλις* was definitely demonstrated (Gusmani 1975, cf. Toporov 1983: 111 with citations). Carruba (1974) tries to prove that the meaning "city" is compatible with "four", cf. the image of a city as "square" (e.g. *Roma quadrata* by Plutarch). An alternative etymology was proposed by Hajnal (1995: 24), who connected "city" with Hittite *kuera-* "field", starting from *kuer-* "to cut". Hajnal assumes the same origin for *tere-* "army".

Carruthers (1933: 152) first mentioned Hittite *kutruwan-/kutruwen-* "witness" (nom. sg. *kutruwas*, nom. pl. *kutruwanes / kutru(w)enes* – see Oettinger 1982: 176 and Puhvel 1982: 182, fn. 6) as a possible derivative of **k^{w}tru-* (< **k^{w}etwr̥-*). The uncommon difference in semantics is not invincible. So Latin *testis* "witness" is derivable from **tristis* "standing as third person to the disputans", cf. Oscan *trstus* "testēs" (**tri-stHo-*), *trístaamentud* "testāmentō" (WH I: 676–77). In Anatolian tradition the "third position" is apparently occupied by the "judge", i.e. "the third (= impartial) person" (Russian *tretij* "third" was also used in the sense of "arbiter, judge", similarly the longer phrase *tretejskij sud'ja* – see Carruthers l.c.), cf. the very common Hieroglyphic Luwian epithet of the ruler *tariwana-* interpreted as "righteous judge", i.e. "impartial person, arbitrator", etymologically "the third" (Eichner 1992: 72–73). On the other hand, both litigators before a court were denotated as *hannitalwan(a)-* in Hittite (derived from *hann(a)-* "to take legal action, litigate") . Eichner (1992: 80–81) also mentions a suggestive agreement in the suffixal extension forming the word-range: *hannitalwan(a)-* (both litigators), *tariwana-* (**tri-wo-n(o)-* "the third one" = "judge"), *kutruwan-* (**k^{w}tr̥-wón-* < **k^{w}twr̥-wó-n-* "the fourth one" = "witness"). Recently Oettinger (1995: 47) has found an important cognate in Hittite *kutris-* n. "Zahl" (after Laroche, earlier "Kürzer"), identifying here *es-* or *is-*stem (cf. *nepis* "heaven" vs. Luwian *happis-* "member" resp.). Now he admits an alternative etymology of Pedersen (*Archív orientální* 5[1933]: 177f), connecting *kutruwan-* with Lithuanian *gudrùs* "wise, clever", in spite of his former preference of Carruther's etymology (1982: 174).

Sommer, *IF* 59[1949]: 205–07 proposed that Hittite ^{LÚ}*duyanalli-*, a title of a palace-official parallel to *tariyanalli-*, is derived from **tuyana-*, and further from a presumed ordinal **turya-* "4th", hence "man of the fourth rank". Although Güterbock (1957: 1–3) rejected it, demonstrating its derivation from the numeral "2", Sommer's etymology has penetrated into handbooks perhaps definitely (cf. Szemerényi 1960: 80; Lehmann 1986: 113; even Schmidt, *IF* 97[1992]: 204, 204; recent discussion — see Tischler III: 422–23).

Armenian:

**k^{w}etwores* "4" > **k^{w}etores* (Pisani assumed a dissimilation **k^{w}...t^{w}* > **k^{w}...t* like in Doric *τέτορες* – see Szemerényi 1960: 20, while Pedersen, *KZ* 39[1906]: 396 proposed a refashion according to f. **k^{w}etosres*; Szemerényi 1960: 21, fn. 99 mentioned that one would expect *r̄* here) > **č'ework'* (Szemerényi 1960: 21; his derivation of **-ork'* < **-ores* based on *k'ork'* < **swesores*, pl. to *k'oyr* < **swesor* "sister", looks very convincingly) or **č'eyor + k'* (Schmitt 1981: 64; Stempel 1994: 299) > Armenian *č'ork'* "4", cf. *č'orek'tasan* "14". The other solutions seem to be less probable, e.g. **ktwores* postulated by Meillet 1936: 54 or **k^{w}etwores* > **k'(i)york'* > *č'ork'* proposed by Winter 1992c: 349, rejecting the direct change **k^{w}e-* > Armenian *č'V-* (but cf. Džaukjan 1967: 168; Schmitt 1981: 64).

Besides the innovations *č'orir* and *č'orrord* (**č'orirord*) "fourth", *č'orek'(r)kin* "fourfold", the other derivatives of the numeral "4" are based on the form **k'ar̄-*: *k'ar̄asown* "40", *k'ar̄ord* "4th", *k'ar̄ajik'* "team of four horses" (*ji* "horse"), *k'ar̄apatik* "fourfold", *k'ar̄ameay* "four years old" (*am* "year"). Brugmann (1892: 497) proposed *k'ar̄-* < **k^{w}tw$_{\mathrm{g}}$r̄-*. Meillet (1936: 100), followed by Schmitt (1981: 131) assumed *k'ar̄-* < **tw$_{\mathrm{g}}$r̄-*. Szemerényi (1960: 21) derived *k'ar̄a(sown)* from **k^{w}etw$_{\mathrm{g}}$r̄(k̂ont-)*, starting again from a dissimilative loss of **-w-* in **k^{w}etar-* > **k^{w}atar-* > **k^{w}ayar-* > **k'ar-*. But nobody from them explains *-r̄-* (usually **-rs-*). That is why Winter (1992c: 354) started from **k^{w}etw$_{\mathrm{g}}$rs*, assuming the following development in a similar way like Szemerényi. Finally, Kortlandt (1994: 255), would expect **k^{w}twr-* > **k'ar-*, explaining *-r̄-* by analogy with *k'ar̄ameay* "quadrennial", *er̄ameay* "triennial" (*am* "year" < **somHo-*). Both preceding solutions are compatible: *k'ar̄-* (derivable from the adverb **k^{w}etw$_{\mathrm{g}}$rs*) could also have influenced the expected **k'arasunta* "40" < **k^{w}etw$_{\mathrm{g}}$rH-(d)k̂ontH_2*. Then the closest cognate appears in Attic *τετταράκοντα* (Winter 1992c: 353).

Phrygian:

**k^{w}etur-* > **k^{w}(i)tur-* (cf. Aeolic *πίσυρες*) > **t΄idur-* *> **θidur-* > Phrygian **diθur-* reconstructed after *διθύραμβος* 'Kultlied des Dionysos', lit. "Vierschritt", cf. Pollux, On. IV, 104: *τυρβασίαν δ'ἐκαλουν τὸ ὄρχημα τὸ διθυραμβικὸν* (Haas 1966: 164–65 **k^{w}etur-ang^{w}o-*, cf. Old Indic *cátur-aṅga-* "viergliedrig").

**k^{w}etw$_{\mathrm{g}}$r-/*k^{w}etru-* > **k^{w}itra-/*k^{w}itru-* > **t΄idra-/*t΄idru-* (cf. Greek *τέτρα-*) > **θidra-/*θidru-* > Phrygian *θίδραξ, θιδρακίν, θοδράκιον, θρίδαξ, θρύδαξ, θρόδαξ* "Huflattich", cf. Athenaeus II 69 D: *'Ιππώνακτα τετρακίνην τὴν θρίδακα καλεῖν Πάμφιλος ἐν γλώσσαις φησί Κλείταρχος δὲ Φρύγας οὕτω καλεῖν* (Haas l.c. *"viereckig", cf. Old Indic *catur-aśra-* id.).

Thracian (?):

**k^{w}et(w)ri-* (?) > Thracian **ketri-*, reconstructed after personal names such as *Κετρε-ζερ[ις]* 'male name from the inscription discovered at Odessos

(Varna)' = Greek *Τετρά-χειρ* or *Κετρι-πορις* "(having) four sons" etc. (Detschew 1957: 243; Georgiev 1977: 85, 101). The *i*-termination of the stem of the numeral "4" is also attested in Greek *τετρίποδας καὶ τρίποδας* (Schwyzer 1939: 590, fn. 2).

Greek:

In Greek dialects the cardinal "4" is attested in more forms representing apophonic variants **k^{w}etw(e/o)r-/*k^{w}(e)tur-* plus **-es* in m. & f. (vs. **-a* in ntr.):

**k^{w}etw^{o}res* > Homeric *τέσσαρες*, Attic *τέτταρες*, Boeotian *πετταρες* (Lejeune 1972: 83, 105);

**k^{w}etweres* > Ionic, Arcadian *τέσσερες* (Lejeune 1992: 105);

**k^{w}etures* > Lesbian *πέσ(σ)υρες* (Hesychios) (Lejeune 1972: 208);

**k^{w} ̔tures* > Homeric (< Aeolic) *πίσυρες* (Waanders 1992: 372);

**k^{w}et(w)ores* > Doric *τέτορες* . This form resembles Armenian *č'ork'*, if one accepts the loss of **-w-*. On the other hand, the expected **-ττ-* (< **-tw-*) could have been simplified under the influence of such the forms as dat. *τέτρασι* etc. (Schwyzer 1939: 590).

**(k^{w})tur-to-* "4th" ? > **τύρτος*, reconstructed after the name of the Laconian poet *Τυρταῖος*, interpreted as "[born on] the fourth [day]" (Bechtel) or "fourth child" (Kluge). Influence of **tri-* may explain *τρυ-* in *τρυ-φάλεια* "helmet (with four *φάλοι* 'crest-holders')" instead of the expected **τυρ-* (Waanders 1992: 372).

**k^{w}étr̥-to-* "4th" > West Greek *τέτρατος*, Attic-Ionic *τέταρτος*, Arcadian *τέτορτος*, Boeotian *πέτρατος* (*-ρα* – instead of expected **-ρο-* under the influence of the cardinal *πέτταρες*).

**(k^{w}e)tr̥-* > *τετρα-/πετρο-*, cf. Mycenaean *qe-to-ro-po-pi* = instr. **κ^{w}ετρόποφι* "quadrupeds", besides *τράπεζα*, Mycenaean *to-pe-za* "table", lit. "four-legged" (Waanders 1992: 372).

**k^{w}etr̥H-(d)ḱontH$_2$* "40" > Attic *τετταράκοντα*, Boeotian *πετταράκοντα* etc. The first component, formally a neuter, corresponds to its counterparts in Indo-Iranian. West Greek *τετρώκοντα* is more problematic. Among various solutions discussed by Waanders (1992: 375–76), the explanation first proposed by J. Schmidt (1889, cf. also Schwyzer 1939: 592) looks as the most promising. Starting from **k^{w}et(w)ōr-* as the first component, it is possible to accept a metathesis in **k^{w}etrō-* under the influence of **k^{w}etr-* in compounds. In principle, this solution is also compatible with the traditional explanation (Baunack) operating with the influence of (Ionic) *ὀγδώκοντα* "80" (= 2 x 40 ?). On the other hand, e.g. Brugmann 1892: 489) sees in *τετρώκοντα* a regular counterpart of Latin *quadrāgintā*, reconstructing **k^{w}etwr̥̄-ḱomtə* (similarly Szemerényi 1960: 15–16).

Illyrian (?):

**k^{w}etōr-* or **k^{w}etr̥-* > Illyrian **katar-* in the place name *Katarbátēs* (Trubačev, ÉSSJ 4: 97).

Albanian:

The most detailed analysis of the Albanian numeral "4" was presented by Hamp (1992: 907–10). Rejecting the premise that the numeral is borrowed from Latin, he offered the following arguments:

The initial syllable *ka-* in all forms of the numeral "4" excludes the sequence **k^{w}e-*. It implicates a generalization of the zero-grade, expected for the ordinal:

**k^{w}tur-to-* "4th" > **k^{w}atur-to-* > **k^{w}atru-to-* > Common Albanian **kátrët-*.

So, Common Albanian m. **kátër* can be derived from **k^{w}atwor-es* or **k^{w}atwr̥-*, while f. **kátërē* can reflect **k^{w}atēr-ās*, perhaps derivable from **k^{w}atesr-es*.

The *e*-vocalism with palatalization is probably preserved in *shtazë* "animal", if it is derived from the compound **k^{w}et(w)ór-pdyā* "quadruped", cf. Old Indic *cátuṣ-pad-* etc. (Huld, *KZ* 98[1985]: 101).

Venetic:

**(k^{w})tru-* > **tru-* in the theonymic epithet *trumus.iiatin* (Lejeune 1974: 85, 102,145). The form *qvartio* is borrowed from Latin, cf. *Quartius* (Lejeune 1974: 102, 338).

Italic:

**k^{w}etwor-* "4" > Oscan *petora* (= ntr. pl. **k^{w}etworā/a*), known thanks to P. Festus 226: after glossing *petoritum* as *Gallicum vehiculum*, so called *a numero quattuor rotarum*, continues *alii Osce quod hi quoque petora uocant* (Coleman 1992: 394). Bammesberger (1995: 213–219) convincingly demonstrates that Latin *quattuor* with unexpected *-a-* and *-tt-* can be derived from the same protoform. He starts from the familiar change *-V̆tt-* < **-V̄t-* , i.e. *quattuor* < **quātuor*. The length is explainable by the influence of the ordinal *quārtus*. The expected Latin protoform could have been **quetuor/*quotuor*, reflecting either **k^{w}etwores* or **k^{w}etwōr*.

**k^{w}etwr̥-to-* "4th" > **que(t)worto-* > **quoworto-* (cf. Praenestine *Quorta*, *CIL* 1.328) > **quaworto-* (cf. *lavāre* "to wash" < **lowā-*) > Latin *quārtus* (Coleman 1992: 410; Bammesberger 1995: 219).

**k^{w}etur-* > Umbrian *petur-pursus* "quadripedibus" (*Ig* 6B 11), cf. Old Indic *cátuṣ-pad-*, Sogdian (Buddhistic) *č'rδ 'p' δw* "quadruped" (EWAI I: 526–27) etc. Oscan abl. *petiru-pert* "four times" with anaptyctic *i* reflects **pet(u)riā* < **k^{w}eturiā* "group of four" (the assumption of Coleman 1992: 394 reconstructing **k^{w}t-* is not necessary) & **-k^{w}ert*. Latin *quater* "four times" can be derived from **k^{w}etrus* < **k^{w}etwr̥-s* (EWAI I: 527; Coleman 1992: 417 assumes **k^{w}turs*). The distributive *quaternī* may reflect **k^{w}etrus-no-* < **k^{w}etwr̥s-no-* (Coleman 1992: 420). On the other hand, Umbrian abl. sg. f. *petrunia-pert* and Paelignian *ptruna* can be derived from **k^{w}etru-* (Coleman 1992: 424).

**(k^{w})tur-to-* "4th" > Oscan *trutum* "quārtum" ?, *trutas* "quārtae" ?

$k^{w}etw_{\underline{r}}H$-$d\hat{k}_{\underline{n}}teH_2$ "40" > *$k^{w}et(w)r\bar{a}gent\bar{a}$* > **quedrāgentā* (distant assimilation **t...g* > *d...g* ?) > Latin *quadrāgintā* (*a*-vocalism after "4"/"4th").

The forms with *-d-* are used in compounds as *quadruplus*, *quadrupes* vs. *quadriiugus*, *quadriennis* etc. besides *quadrāns* "quarter". Its origin remains unclear. Hamp (*Studi clasice* 17 [1977]: 151) assumed a regular character of the change **-twr-* > *-dr-*.

Celtic:

$k^{w}etwores$ "4" m. > Brythonic **petwares* > Old Welsh *petguar-id*, (Middle) Welsh *pedwar*, Cornish *peswar*, Old Breton *petguar*, (Middle) Breton *pevar*, cf. Old Brythonic *Πετουαρία* 'town of the Parisii' (Ptol.) and Gaulish (La Graufesenque) *PETUAR[ios]* "4th". Old Irish nom. m. *cethair* "4" reflects *$k^{w}etwōres$* rather than *$k^{w}etwores$*; nom.-acc. ntr. *cethair^{L}* can be derived from *$k^{w}etwōri$*, cf. Old Indic *catvā́ri* (Greene 1992: 508). The Old Irish composition form *cethar-^{L}* (*cethr-* before vowels) reflects Goidelic *$k^{w}etwaro$-*, which is compatible with Gaulish *petor-ritum* "four-wheeled vehicle" < **petworo-rítum* (de Bernardo Stempel, *ZCP* 46 [1994]: 23, fn. 56).

$k^{w}etesres$ "4" f. > Old Irish nom. f. *cethoir*, *cethéoir*, Middle Welsh *pedeir*, Cornish *peder*, *pedyr*, Breton *peder* (Cowgill 1957: 33, rejecting the traditional reconstruction *$k^{w}etesor$-*; McCone 1993: 71 reconstructs nom. *$k^{w}éte$-$sōr$* vs. acc. *$k^{w}te$-sr-$\underline{n}s$*).

$k^{w}etwor$-iyo- "4th" > Brythonic **petwariyo-* > Old Welsh f. *petguared*, Middle Welsh m. *petwerydd* / f. *pedwaredd*, Old Breton *petguare*, Modern Breton *pevare*, cf. Old Brythonic *Πετουαρία* 'town of the Parisii' (Ptol.); Gaulish (La Graufesenque) PETVAR[*ios*] (Vendryes 1987: C-87; Greene 1992: 542; Lambert 1994: 131), (Coligny) PETVORIV "from the fourth", PETIVX = *petuorio-noux* "fourth night", cf. TRINVX = *tritio-noux* "third night" (Olmsted 1988: 293). This same suffixal extension in the Indo-Iranian ordinal **turiyo-* confirms its originality. On the other hand, Goidelic *$k^{w}etrametos$* "4th" > Old Irish *cethramad* is an innovation remodelled after **sextametos* "7", where **-etos* was abstracted from *$k^{w}enk^{w}etos$* "5th" (Greene 1992: 515).

$k^{w}etru$- > Gaulish (Latinized inscription of Gélignieux, cf. Hirunuma 1988: 39) *petrudecametus* (*CIL* 13.2495) = Middle Breton *peuardecuet* "14"; Gaulish proper names *Petru-corius* (*CIL* 12.275), *Petru-corii* (Sulpicius Seurus, Chronica II: 45,7), *Petru-cor[ii]* (*CIL* 13.972) etc., lit. "[people of] four tribes" or "[possessing] four armies" (Billy 1993: 119), Welsh *pedry-* "vierfach".

$k^{w}etru$-$(d)\hat{k}ont$- "40" > Old Irish *cethorcho*, *cethorchae* (*nt*-stem) (Thurneysen 1946: 247; Szemerényi 1960: 18 reconstructs Celtic *$k^{w}etrākont$* < *$k^{w}et_{\underline{r}}\hat{k}ont$-*).

Germanic:

$k^{w}etwóres$ m.-f. / *$k^{w}etwórH_2$* ntr. "4" > early Germanic *$\chi^{w}e\underline{b}wóriz$* / *$\chi^{w}e\underline{b}wóra$* > Germanic **féðwōr* (*f-* after **fimf* "5") > Gothic *fidwor*, Crimean Gothic *fyder* (Lehmann 1986: 113–14); North Germanic

**feður-* (with the subsequent changes: i. loss of *ð* before *r* compensated by lengthening of the preceding vowel or diphthong, ii. *ð* > *g* between a back-vowel and *u*): nom. m. **feðurēR* > **fjǫ́ðrir* > Icelandic *fjórir* etc. besides **feðuriR* > **fiuðrir* > **fiūrir* > Old Swedish *fȳri(r)*, Old Danish (Skånsk) *fiūri*, *fȳri*, *fīri*; nom.-acc. ntr. **feðurō* > **feður* > **fegur* > Old Icelandic *fiogor*, Modern Icelandic *fjögur*, Old Norwegian *fiogor*, *fiugur*, Modern Norwegian *fjogo*, Old Swedish *fiughur*, Old Gutnic *fiugur*, Old Danish *fiughur* > *fiūr* etc. (Ross & Berns 1992: 579–80 with more details); West Germanic **fegwariz* (from **χʷeχwáriz* with *-χw-* after the first syllable or the hypothetical **fenχʷe* "5" ?) > nom. m.-f. **fewariz*, nom.-acc. ntr. **fegwurō* > **fewuru* > **fe(w)ur* / **fi(w)ur*; the concrete forms represent a contamination of these starting-points: Old High German *feor*, *fior*, *fiar*, *fier*, Middle & Modern High German *vier*, Old Saxon *fior*, *fiar*, Middle Low German *vêr*, *vir*, Dutch *vier*, Old English *feor* besides Old Saxon *fiuwuar*, *fiuuar*, Old Frisian *fiôwer* / *fiûwer*, Modern Frisian (West) *fjouwer*, *viower*, (East) *fjau(w)er*, *fjuur* (Sylt & Helgoland; recent even *shtjuur* !), Old English *fēower*, Modern English *four* (Mironov 1963: 351–52; Ross & Berns 1992: 583–84; Beekes 1987: 219 sees in pre-Germanic **kʷetwōres* an original sg. **kʷetwōr* plus a plural ending **-es*).

**kʷetwōr-dekm̥* "40" > Germanic **feðwōr-tegu-* > Gothic acc. *fidwor tiguns*; Old Icelandic *fiórer tiger* besides *fiorutigi*, Modern Icelandic *fjórir tugir*, Old Swedish *fiūritighi* etc., Old High German *fiorzug*, Old Saxon *fiortig*, *fiartig*, *fiertich*, Dutch *veertig*, Frisian *fjirtich*, Old English *feortig* etc. (Ross & Berns 1992: 615).

kʷetur-*/kʷetwr̥* > Germanic **feður-* "4" (in compounds) > Gothic *fidur-dogs* "four days", *fidur-falþ* "fourfold" etc., Old Swedish *fioþer-tiugher* "containing forty", Old English *fyþer-fēte*, Salish-Frankish *fitter-thuschunde* "four thousand" (Lehmann 1986: 113).

**kʷetursnó-* > Germanic **feðurzna-* > West Norse **feðrRnR* > **feRnR* > Icelandic nom. pl. *fernir* "in sets of four" (Ross & Berns 1992: 647).

**kʷetwr̥-to-* "4th" > Germanic **feðurþa-* > ? Gothic **fidurda* reconstructed after Crimean Gothic *furdei-thien* "40"; with loss of **-ð-* described above North & West Germanic: Old Icelandic *fiorþe*, Modern Icelandic and Faeroese *fjórði*, Norwegian *fjorde*, Old Swedish *fiorþe*, *fiarþe*, *fiærdhe*, Modern Swedish *fjärde*, Old Danish *fiarthi*, *fiarþæ*, *fiærdhe*, Modern Danish *fjerde* (Ross & Berns 1992: 627).

Balto-Slavic:

**kʷetur-* "4" > Baltic **ketur-* > Lithuanian m. *keturi*, f. *kẽturios*, declined as a *jo/jā* stem adjective (cf. nom. pl. m. *dìdis* vs. nom. pl. f. *didžios* "big" – see Vaillant 1958: 627) with the exception of the acc. m. *kẽturis* < **keturins* < **kʷeturn̥s*, representing one survival of the original *r*-stem declension; Latvinian *četri* instead of the expected **cẹturi* has changed its anlaut under the influence of Russian *četýre*, cf. the unchanged anlaut in old records as *cettre*, *coetr*; the lost **-u-* is yet preserved in *četuris*, *četuriem* (instr. in some dialects)

or in old records as *czeturkort* (1753 – see Smoczyński 1989: 98, fn. 10). Yatwingian *teter* "4" can reflects **cet[v]er*, cf. *cit* "other" vs. Lithuanian *kitas*, Latvian *cits* (Zinkevičius 1984: 19, 11). Slavic: Old Church Slavonic m. *četyre* / f.-ntr. *četyri*, Bulgarian *četíri*, Macedonian *četiri*, Serbo-Croatian *čètiri*, Slovenian (Archaic) *četírje* / *četíri*, (Modern) *štírje* / *štíri*, Slovak *štyria* / *štyri*, Old Czech *čtyřie* / *čtyři*, Czech *čtyři*, Upper Sorbian *štyrjo* / *štyri*, Lower Sorbian *styrjo* / *styri*, Polabian *citĕr* (**četyr*), Slovincian *štěřej(i)* / *štěrë*, Polish *czterej* (older *cztyrze*) / *czterzy*, Byelorussian *čatýry*, Ukrainian *čotýry*, Russian *četýre*. Common Slavic m. **četyre* and f.-ntr. **četyri* (**-i* < **-ī s* < **-ins*, orig. acc.) are derivable from **kʷetūres* and **kʷetūr̥s* resp., with the exception of West Slavic & Slovenian, where the initial cluster reflects **čьt-*, sometimes interpreted as an allegro-form, but in principle derivable from a zero-grade **kʷt-* (Hamp, *IF* 85[1980]: 40). The most complicated question is still the origin of **-ū-*. Vaillant (1958: 628) thought that the alternation **-wō-* : **-u-* (**kʷetwōr* : **kʷetur-*) was replaced by **-wō-* : **-ū-* in Slavic, giving **-va-* : **-y-* (*kvasъ* : *kys-*; so already J. Schmidt). Hamp (*IF* 85[1980]: 41) assumed here an implication of the Sievers – Edgerton law, proposing syllabification **ktuu̯r* – > **ktuur-* > **kĭtūr-*. An original solution was presented by Kortlandt, who found a starting-point in the form **kʷetur-sr-es* (see Beekes 1987: 216), corresponding to the feminine known from Indo-Iranian and Celtic.

The numeral "40" represents a simple compound of the cardinals "4" and "10": Lithuanian *kẽturiasdešimt* (acc. pl. f. of *keturì* plus indeclinable *dešimt* – se Stang 1966: 281) and Common Slavic **četyre desęte* (nom. pl. of **desęťь* – see Trubačev 1977: 98).

**kʷetwer-/*kʷetwor-* "4" (collective) > Lithuanian m. *ketverì*, f. *kẽtverios*; Old Church Slavonic *četvorъ*, Serbo-Croatian *četvoro*, *četvero*, Slovenian *četvêr*, Czech *čtvero*, Lower Sorbian *stwóry*, Polabian *citvărā*, Polish *czworo*, Old Russian *četvero*, *četvero*, Russian, Ukrainian *čétvero*, Byelorussian *čacvëra*.

**kʷetwr̥-to-* "4th" > Balto-Slavic **ketvirta-* > Lithuanian *ketviřtas* (Latvinian *cętuřtais* is remodelled after an unattested cardinal **cęturi*), Prussian *kettwirts*; Common Slavic **četvьrtъ* > Old Church Slavonic *četvrъtъ*, Bulgarian *četvărti*, Macedonian *četvrt(i)*, Serbo-Croatian *čètvrti*, Slovenian *četŕti*, Slovak *štvrtý*, Czech *čtvrtý*, Upper Sorbian *štwórty*, Lower Sorbian *stworty*, Polabian *cit'ortĕ*, Kashubian *čvårti*, Slovincian *čvjårti*, Old Polish *cztwarty*, Polish *czwarty*, Byelorussian *čacvёrty*, Ukrainian *četvértyj*, Russian *četvёrtyj*.

(Comrie 1992: 741–45; Smoczyński 1989: 66–69, 98–99; Stang 1966: 278–85; Trubačev 1977: 93–98; Vaillant 1958: 627, 643–44, 654–55; Valčáková, ESJS 2[1990]: 104–05)

Tocharian:

**kʷetwores* "4" > Common Tocharian **śətwerə* > A m.-f. *śtwar*, B m. *śtwer* (*śwer*).

**k^{w}etworH$_2$* "4" ntr. > Common Tocharian **śətwara* (*a*-umlaut) > B f. *śtwāra*.

**k^{w}etwr̥-to-* "4th" > **k^{w}etr̥-to-* > Common Tocharian **śətərte* > A *śtärt*, B *śtarte*.

**k^{w}etwr̥H-(d)ḱn̥tH$_2$* (Winter) or **-(d)ḱonts* (> **-kōs* see Klingenschmitt 1994: 329) "40" > Common Tocharian **śətwaraka* > A *śtwarāk*, B *śtwārka* .

(Van Windekens 1976: 489; Winter 1992b: 106, 118, 136 and 1994: 191)

§2. Reconstruction

The most complete reconstruction of the numeral "4" systematized in the following basic paradigm was proposed by Beekes (1987: 219 and 1995: 212–17):

sg. nom. **k^{w}et-wōr*	pl. nom. **k^{w}ét-wor-es*	f. **k^{w}et-ur-sr-es*
acc. **k^{w}t-wér-n̥*	acc. **k^{w}it-wér-n̥s* (sic)	(but Hamp 1979: 45 **k^{w}turms*)
gen. **k^{w}t-ur-ós*	gen. **k^{w}t-ur-óm*	

The alternation *-e-* : *-i-* in the root vocalism resembles the reduplicated stems of the type **b^{h}éb^{h}r̥*, gen. **b^{h}ib^{h}rós* "beaver" (Beekes 1995: 171, 190).

The collective in **-er-o-* (**k^{w}etwero-* "fourfold") was derived from the accusative stem.

As a compound the zero-grade **k^{w}tur-* was originally used; but it was usually restored in **k^{w}etur-V- / *k^{w}etwr̥-C-* (> **k^{w}etru-*).

The 'ideal' ordinal **k^{w}tur-ó-* is not attested anywhere. The closest form appears in Indo-Iranian **k^{w}tur-(ī)yo-*, cf. also *p*-Celtic **k^{w}etwor-iyo-* and the Baltic cardinal and collective in *-ja/jā-*. The most widespread form of the ordinal is **k^{w}etwr̥-to-*.

Besides the Balto-Slavic and Germanic innovations, there is a common protoform **k^{w}etwr̥H-(d)ḱont(e)H$_2$* "40". Kortlandt and Beekes identified **-H-* = *-H$_1$-* = *ʔ*, seeing its origin in a substitution of the lost **d* by its glottal component , i.e. **dḱ* > **ʔḱ*. On the other hand, Harðarson (1987: 97) convincingly demonstrated a regular substitution **-ōr* > **-r̥-H$_2$*, which implies **-H-* = **-H$_2$*.

§3. Etymology

Perhaps for no other numeral so many etymologies have been presented. Although some of them seem to be rather bizarre, seeking the most probable solution, it will be useful to analyze them.

1. The most pessimistic point of view is proposed by Lehmann (1991: 137), concluding that the CVCV pattern of the numeral "4" is not Indo-European, rather that of Hurrian or Caucasian language. He preferred to see the original numeral "4" in the Anatolian counterpart **meyu-*, forming the pair "the lesser hand" vs. **penk^{w}e* "5" = "the whole hand".

2. Quite isolated and quite unconvincing is the attempt of Shields (1991: 265–72), analyzing the numeral as follows: **kwe-* "that one" + **-t* 'non-sg. marker' + **-u* 'non-sg. > du. marker' + **-or* 'non-sg. collective marker'.

3. Bremer (1924: 20) proposed that **k^{w}etwŏr-* "4" and **oḱtō^{w}-* "8" are related, deriving both from **ok-* (sic) "eye". He reconstructed **oketo-* "Augenheit" = "2 eyes", which is supposed to form **okétowóres* consisting of **oket-* + **dwō* "2" + **res* "thing" !?

4. Muller (*IF* 44[1927]: 137–38) also tried to connect the numerals "4" & "8", reconstructing **oḱeto-* "set of points (= fingers)", du. **oḱ^{ĕ}tō^{u}* "8", while "4" is supposed to be a compound **oḱet(o)+*wŏro-* "set of points" + "series", cf. Old Indic *vāra-*, Lithuanian *vorà* "series". In the following development he expected the labial assimilation in **^{o}k^{w}etwŏr-* etc.

5. Čop (1972: 170–71) saw in **-wŏr-* a parallel suffix to **-(e)sr-*, forming feminine of "3" & "4". If the latter suffix is derived from the word **H$_{1}$ésōr*, gen. **H$_{1}$srés* "woman" (cf. Oettinger, *IF* 91[1986]: 116–28; on the contrary Normier, *IF* 85[1980]: 47–48 tried to exclude the presence of the feminine suffix, segmenting the Aryan-Celtic 'feminine' forms as **tris-(o)r-* and **k^{w}etrus-(o)r*; similarly Snyder, *KZ* 84[1970]: 2–4), it is quite natural to expect a masculine counterpart in **-wŏr-*. Čop sought a verification in **-wēr*, representing the second component of **deH$_{2}$ywēr* "husband's brother". It is tempting to compare the parallel masculine formations in the Old Irish personal collective nouns as *triar* and *cethrar* etc., "threesome" and "foursome" resp., usually derived from **tri-wiro-m* and **k^{w}etru-wiro-m* "[group of] three / four men" (Thurneysen 1946: 243–44; McCone 1993: 71).

6. Güntert (*Wörter und Sachen* 11[1928]: 141) assumed the original semantics "die Spitzen eines Kreuzzeichens", relying on Latin *triquetrus* adj. "three-cornered"; n. "triangle", cf. Old English *þri-feðor* "triangle" (Holthausen, *IF* 48[1930]: 254).

7. Machek (1957: 95) reconstructed **ke(to)-twor-es* "(zwei) Paarbildungen", where the second component is related to Slavic **tvoriti* "to form".

8. Erhart (1970: 94–97) analyzed the numeral "4" as follows: **k^{w}et-* "pair" + **H^{w}o* 'dual marker' + *r*-termination of heteroclitic nouns. Let us mention that the same idea was proposed by Šafařík already in 1848 (see 1865: 631–32), including a comparison of Russian *četa* "pair" with Hungarian *két*, *kettö* "2".

9. Cohen (1984: 3–6) assumed an original reduplication **kwet+kwet* "2+2", leaning on 'Fenno-Ugric' **kwet* (!) "2". He admitted that "the origin of the *-r* in **kwetw(o)r-* is unclear".

10. Schmid (1989: 23–24) isolated a suffix **-wŏr-* and connected it with **-w̥r̥-* forming the Greek neuters in *-αρ*. The bare root **k^{w}et-* itself is compared with Lithuanian *kẽsti*, pres. *kečiù*, pret. *kečiaũ* (**k^{w}et$_{i}$ō*) "ausbreiten, ausspannen, entfalten, öffnen" (Fraenkel 1962–65: 246). Schmid assumed the semantic starting-point "Hand ausbreiten" = "Vier-Finger-Breite", illustrating this semantic motivation by the words for "span", frequently analyzable as "stretched [fingers]". The idea connecting **k^{w}etwŏr* with Lithuanian *kẽsti* was proposed already by Toporov 1983: 130. Let us add Tocharian B *ktakät* "finger gesture, spreading of the fingers", perhaps derived (reduplication?) of AB *kät-* "to scatter, spread" (Hilmarsson 1996: 186; 108–09 otherwise).

11. Hopkins (*AJPh* 13[1892]: 85–86) segmented the numeral in **kʷe-tur-* "[1] plus 3", not explaining the difference between **tur-* and **tri-* "3" (cf. already Šafařík 1865: 633). Cuny (1924: 8f) tried to solve it by postulating that the undesirable **-w-* is an infix (!). Accepting this segmentation, Fay (*AJPh* 31[1910]: 417–18) proposed **kʷe-* "et" + **twŏr-/*tur-* "potens"; similarly Carnoy (*Muséon* 59[1946]: 564f). Van Windekens (1982: 9) also separated the copula **kʷe* used between numerals, while in **-twor-* he saw the same root as in Lithuanian *tvérti* "fassen, greifen", *turĕti* "halten, haben", *ãp-tvaras* "Gehege, Zaun", i.e. "[four] grasping [fingers]".

§4. Discussion

Ad 1. The Hurrian & Caucasian forms for the numeral "4" are quite different from **kʷetwŏr-*: Hurrian **tumn-* "4" (*tumn-adi* "group of four", cf. perhaps related *tamra-* "9" – see Wilhelm, *Orientalia* 61[1992]: 134–35); East Caucasian **hĕmq̇i* "4" > Chechen *-iʔ*, Bats *ʕiwʔ*; Avar *unq̇q̇o*, Ginukh *uq̇i-no*; Lak *muq̇*; Agul of Chirak *aʁʷal*; Rutul *juq̇u-d*, Tabasaran *juq̇u-b*, Archin *buq̇i*, Udin *bip*; Khinalug *unʁ* etc. and West Caucasian **p̌ǎ'ə* (Nikolaev & Starostin 1994: 488–89); Kartvelian **otxo-* (Fähnrich), or **o(ŝ)tx(w)-* "4" (Gamkrelidze), probably represents a borrowing of (late) Indo-European **oḱto-* or early Indo-Iranian **oćto-* > **aśta-*, continuing in Avestan *ašti-* "breadth of four fingers", cf. du. **oḱtō(u)* "8" (Blažek, *Georgica* 21[1998]). There is one possibility in Etruscan *huθ*, if it really meant "4". The strongest argument for it was proposed by Oštir (1921: 34) and supported by Kretschmer (*Glotta* 11[1921]: 277 and 18[1930]: 110f). They found a confirmation of the identification *huθ* = "4" in the pre-Greek name Ὑττηνία of the city Tetrapolis in Attica, cf. the witness of Stephanus Byzantius Αὔτη (ἡ Αττικὴ) Τετράπολις πρότερον ἐκαλεῖτο Ὑττηνία (further discussion see e.g. Vetter, *Sprache* 8 [1962]: 133–34).

Ad 2. Shields' etymology is apparently artificial. At least one of his ideas could be developed, namely a hypothetical presence of the interrogative stem **kʷe-* (Avestan *čaiti* "wie viele?, wie vielfach?", Breton *pet dez* "quot dies", *petguez* "quotiens" < **kʷeti-*). There are some *kʷ-* derivatives indicating semantic proximity with the numeral "4", e.g. **kʷo-tero-/ *kʷu-tero-* "which of two", Latin *quantitās* "quantity, amount, number, sum", maybe Tocharian A *kaś*, B *keś* "number", derivable from **kʷoti-* (Mann 1984–87: 1049). The question of internal structure remains open.

Ad 3 & 4. Both etymologies are unconvincing phonetically and especially semantically.

Ad 5. Čop's attempt is doubtless legitimate. The weakest point of his etymology is the absence of a direct proof for the masculine function of the root **wŏr-* (Čop added an external parallel, namely Fenno-Ugric **wara* > Komi *veres* "husband", *pi-ver* "brother of man", where *pi* "son, boy" etc.).

Ad 6. As a primary motivation Latin *-quetrus* "corner" appears to be very suggestive. But its technical, i.e. cultural meaning, indicates that the direction

of the semantic development could be opposite, cf. e.g. Spanish *cuarto* "room" ("fourth" > "four-cornered") or Arabic *rabbʕa* "to square" (Holmer 1966: 29–30).

Ad 7. It is apparent that this construction is quite artificial.

Ad 8. Erhart's premise of a geometrical succession **H^{w}o* 'dual marker'/ **k^{w}et-* "pair" (= 2^1), **k^{w}et-H^{w}o-r* "4" (= 2^2), **H^{w}o-k̂t-oH^{w}* "8" (= 2^3) can be supported by existing numerical systems. So e.g. Werchikwar dialect of Burushaski from Yasin (Hindukush) uses *altán* "2", *wáltu* "4", *altámbu* "8" (Berger). Similarly in Haida, an Amerindian language from North-West Canada, there are *stîñ* "2", *sta'nsîñ* "4", *sta'nnsañcha* "8" (Swanton). The main problems are in phonology. The sequence **-t-* + **-H-* would cause aspiration in Indo-Aryan. The assumed dissimilatory change **-k^{w}t-* > **-k̂t-* has no analogy within Indo-European. Also the dual has been used only suffixally, never prefixally (it would be solvable if we admit the reduplication **k^{w}et(o)H^{w}(o)-k^{w}etoH^{w}* "4" + "4" > **H^{w}oKtoH^{w}* "8"). In spite of these objections the etymology should not be rejected without any deeper analysis. The etymology is based on the existence of **k^{w}et-* "pair", continuing practically only in Slavic: (i) **četъ* m. > Bulgarian *čet* "number", Old Czech *čet* "multitude; number", Slovak *cet* "even number", Polish dial. *cot* id., Old Russian *četъ*, Russian *čët*, Byelorussian *čot*, Ukrainian *čit*; (ii) **četьnъ* > Bulgarian *čéten* "even", Macedonian *četen* "ordinary", Serbo-Croatian *četnî*, Slovenian *čéten* id., Czech *četný* "numerous", Slovak *četno* adv. "what is even", Polish *cetno i licho* "even and odd", dial. *cotny* "even, in pair", Russian *čëtnyj*; (iii) **četa* f. > Bulgarian *čéta* "train, company", also "pair" (Gerov), Macedonian *četa* "train, division, troop", Serbo-Croatian *četa* "division", Slovenian *čéta* id., Czech *četa* id., Old Russian *četa* "division, train, community, congregation", Russian dial. *četa* "pair, equal", Byelorussian *četá* "part, equal, pair"; (iv) ? **četь* > Old Russian *četь*, Russian, Ukrainian *čet'* "quarter, fourth part of arable land" – more probably shortened from *četvьrtь* "quarter" than an archaism how e.g. R. Jakobson, *IJSLP* 1/2[1959]:275 judged, cf. Trubačev 1977: 92–97. The etymology is not safe. The most natural derivation from Slavic **čisti* : **čьtǫ* (**keit-tei* : **kĭtō*) "to count, think, read" (Trubačev, l.c.) agrees perfectly in semantics, but the difference in vocalism remains problematic. The traditional comparison with Latin *caterva* "troop", Umbrian *kateramu* "congregamini", Old Irish *ceithern* "troop" (Stokes 1894: 76) is doubtful for more reasons. So WH I: 181–82 accept the derivation from **kates-owā*, related to *catēna* "Kette" < **kates-nā*. The Irish word can be derived from *cath* (WH l.c.), unless it is borrowed from Latin *quaterniō* "troop consisting of four men" (Vendryes 1987: C-58–59). Umbrian *k-* excludes the reconstruction **k^{w}-*. Finally, from the point of view of semantic typology, the development "pair/couple/number" > "several" > "troop" etc. is undoubtedly natural, but not vice versa.. The closest parallel corresponding also in the 'paired' meaning appears in Ossetic *cæd* "team of two oxen" (Abaev I: 293). The preceding analysis allows to reconstruct **k^{w}eto-* (or **keto-* !) "pair, couple" and / or "number" (cf. also Hittite *kutris-* "number" !). Since it is an *o*-stem, the dual would have the form

**k^{w}etō(w)* "two pairs". With the collective marker we get **k^{w}etwŏr*. So the Erhart's (and already Šafařík's) etymology can be reinterpreted.

The Hungarian attrib. *két* and subst. *kettö* "2" represent palatal variants **kektä* and **kektä-kä* resp., typical for Ugric (**-ka/*-kä* is the dual suffix – see Xelimskij 1982: 118–18; Fenno-Ugric reconstructions follow P. Sammallahti), while in Fenno-Permic the form **kakta* can be reconstructed. There are no traces of labial vocalism in Fenno-Ugric. On the Indo-European side, only the alternative **ket-* is compatible with Fenno-Ugric data, but only if there was a very early metathesis **kakta* < **kat-ka* = "two-DUAL" (caused perhaps by analogy to **ükte* "1"), cf. Indo-European **dwo-H$_{1}$* (Beekes 1995: 212). We can accept that the hypothetical Fenno-Ugric archetype **kat-ka /*ket-kä* "2" and the Slavic-Ossetic isogloss **ket-* "pair" are related, but the numeral **k^{w}etwŏr* "4" is not derivable from **ket-*.

Ad 9. Cohen's 'Fenno-Ugric **kwet-* "2"' has no real basis (cf. the preceding comments). On the other hand, the alternation in the root vocalism (see §2) indicates a possibility of a reduplication of the type **k^{w}e(t)-k^{w}t-* + *-ŏr* : **k^{w}i(t)-k^{w}t-* + *-ér°* > **k^{w}etwŏr* : **k^{w}itwér°* or sim.

Ad 10. There are more body part names formed in **-w$_{2}$r*, e.g. **sneH$_{1}$-w$_{2}$r* "sinew" (Hittite *ishunawar*, Tocharian B *ṣñor*), **ĥkreH$_{2}$-w$_{2}$r* "horn" (Hittite *karāwar*, Tocharian A *kror*). The form **k^{w}et-w$_{2}$r* proposed by Schmid, if derived from a verb continuing in Lithuanian *kẽsti* "ausbreiten, ausspannen, entfallen, öffnen; die Hand gegen jmd. erheben" (Fraenkel 1962–65: 246–47), could denote "span" (Schmid 1989: 23 convincingly demonstrates that just this semantic motivation is typical for various denotations of "span" in Indo-European languages). This solution opens a further room: developing the ideas of Carruba and Hamp, it is possible to imagine a compound **meH$_{1}$u-k^{w}etw$_{2}$r* "big span" or "measure span" resp. > "4", reduced in Anatolian in **meyu-* and in non-Anatolian in **k^{w}etw$_{2}$r* . On the other hand, there is an alternative semantic starting-point, cf. Lithuanian *ketėti* "vorhaben, beabsichtigen, sich anschicken, gedenken", *kẽsti*, *kėtù* "heftig wünschen", *kėsìntis* "sich vermessen", *kẽslas* "Vorhaben, Plan, Absicht" etc. (Fraenkel 1962–65: 247). Mann (1984–87: 1029, 1655) also quoted Lithuanian *ketas* "aim, intention" and added Welsh *pedw* "completion; square" (!). It means that the primary meaning could be "number" (cf. Hittite *kutris-* "number"). It is remarkable that the semantic dispersion of the Slavic words **četъ*, **četa* ("pair" – "number") allows to derive them from both semantic patterns. The third modification of Schmid's solution could be based on the semantics "finger(s)" (= "stretched [part of] hand" ?), if the final **-ōr* in **k^{w}etwōr* really represents a collective suffix. On the other hand, a compound of the type **meyu-k^{w}etw$_{2}$r* "little finger" is in principle also possible here (cf. the etymology of Heubeck explained above). But the primary meaning could be directly "little finger", cf. Avestan *kutaka-* "little", Middle Persian *kōtak* "geringfügig; Kind", Modern Persian *kōdā* "Kind" (Bartholomae 1904: 472) and maybe French & Catalonian *petit* (*pititus* 7th cent.), undoubtedly of Gaulish origin (Lambert 1994: 197). In this

case Anatolian **meyu-* (Heubeck) and non-Anatolian **k^{w}etw̥r* would represent synonymes. At least an undirect support for the 'little finger'-etymology can be represented by Greek (Oppianus Anazarbensis) *μύωψ* "little finger" (see Pott 1847: 288), if it is compatible with the Anatolian **meyu-* "4", originally **mey-u-* "little".

Let us add that Terentjev (1972: 77) presented an attempt to prove the primary meaning "forefinger" for **k^{w}etwŏr-*, relying on the external comparison with Fenno-Ugric **kut(t)i-* "6". He saw an explaination of the semantic difference in the way of counting on one hand, known in more traditions of Northern Eurasia: bent little finger = "1", ... bent forefinger = "4", thumb = "5", stretched forefinger = "6" etc. Elsewhere I tried to demonstrate that Fenno-Ugric **kut(t)i-* "6" is derived from Uralic **kutti-* "back", like Samoyed **mə̑ktut* "6" from **mə̑kə̑* "back", hence "6" = "beyond [5]" (Blažek, *Philologia Fenno-Ugrica* 2–3[1996–97]: 7).

Ad 11. For all the solutions identifying an enclitic copula **k^{w}e* in the first syllable, a common problem exists: an unconvincing semantic motivation of the second component **-twŏr, *-tur* etc. One would expect some 'bearer of quaternity', but none of the etymologies quoted in § 3.11 offer any similar semantic motivation. The following solution fulfils this condition.

Hamp (1986: 253) studies Celtic **durno-/ā* continuing not only in Welsh *dwrn* m. "knob, handle", *dyrnfedd* "four-inch handbreadth", Breton *dorn* "hand" and Irish *dorn* "fistful", but also in Romance borrowings such as Medieval Latin *durnus* "3 digitos", Old Provensal *dorn*, Old French *dor* "mesure contenant 4 doigts", French dial. (Annecy) *tour* "mesure de la grosseur des porcs qui se fait au moyen du poing fermé et du pouce étendu". The closest cognate appears in Latvian *dùre, dûris* "fist", while the other parallels collected by Pokorny (1959: 203), such as Greek *δῶρον* "Handfläche, Spanne der Hand (Längemass)", *ὀρθόδωρον* "der Abstand von der Handwurzel zur Fingerspitze", are compatible only if they reflect **dwōr-*. It would also be tempting to add Tocharian B *trau*, pl. *traunta* "measure of capacity" (**dur-o-unt(s)/-went-*) and Hittite or Luwian *taraw(a)r*, abl. *tarawana*[z] "handful" > "measure of capacity" (Melchert 1993b: 211 connected it with *tarāwi(ya)-* "to hand over, deliver", cf. also Hittite adv. *tarrawa* "der Länge nach, ausgebreitet", a derivative of *tarru-* "ausgedehnt; mächtig" – see Tischler III: 154). The development of the sequence **dwo-* > Hittite *ta-* has an analogy in the derivatives of Indo-European numeral "two", e.g. *d/tamāi-* "other" < **dwoyosmōi* (Puhvel, *IF* 92[1978]: 103). If we accept this solution, we get the pair **d[w]ŏr-w̥r* vs. **dur-n-*. Regardless of the position of the Tocharian & Anatolian words, we have found a good candidate expressing the quaternity on the basis of body parts. Of course, there is a significant difference between **d-* and the expected **t-*. It seems that this irregularity may be explained as due to the pressure of analogy characteristic for the neighboring numerals "3" & "4", hence **oy- *dwoH$_1$ *tri-*k^{w}e *dur- *pen(g^{h}?)-*k^{w}e* = "1", "2", "3" plus, "4", "5" plus, giving **oy- *dwoH$_1$ *tri- *k^{w}etur- *penk^{w}e* ?

There are remarkable external parallels supporting the reconstruction **dur-*, **dwor-* etc. in Altaic **tōr-/*tūr-* (Starostin): Turkic **dȭrt* (Dybo) "4" // Mongolian **dör-ben* "4", **dör-igü* "four-fingers-wide", **dö[rt]ïn* "40" // Tungus **duj-gin* "4" (see Blažek, *Studia Etymologica Cracoviensia* 2[1997]: 37, 47, 56; the first scholar presenting this comparison was probably A. Trombetti 1923: 152).

§5. Conclusion

It seems that the most promising solution is the etymology proposed by W.P. Schmid with the modifications analyzed in §4.10. It is not possible to decide, whether the primary semantic motivation was "(big) span", "(little) finger" or "number". The alternative solution separates the enclitic copula **k^{w}e* and determines the bare root **dur-* (> **tur-* after **trey-* "3"). It fits semantically better and can be supported by external parallels. Its weakest point is its phonetic irregularity.

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INDO-EUROPEAN "five"

§1. The numeral "5" is common for all branches of the Indo-European language family. The attested forms can be projected into the following partial reconstructions, allowing their deeper analysis.

Indo-Iranian:

**pénkʷe* "5" > Mitanni-Aryan *pa-an-za-(wa-ar-ta-an-na)* "fifth (turn)", Old Indic (RV) *páñca* "5", later (AV) also *pañcá* after *saptá*, Pali *pañca*, Prakrit *paṁca*, Sindhi *pañja*, Sinhali *paha*, adj. *pas*, Kati *puč*, Ashkun *ponc*, Prasun *wucu*, Gawar *pōnc*, Shumashti *pon*, Shina of Gilgit *poĩ*, Kashmiri *pə̄nc* etc.; Avestan *paṇča*, Old Persian **pančauva-* "Fünftel" (reconstructed according to Elamite *pan-su-ma-iš* – see Hoffmann 1965: 249), Khotanese *paṃjsa*, Tumshuq *paṃtsi*, Khwarezmian *pnc*, Sogdian *pnč*, Yaghnobi *panʒ*, Ossetic *fonʒ*, Pashto *pinʒa*, Shugni *pinʒ*, Ishkashim *punʒ*, Parachi *pə̃nč*, Ormuri *pēnc*, Middle Persian of Turfan *pnz*, Parthian *pnǰ*, Modern Persian *panǰ*, Kurdic *panǰ*, Baluchi *pančˇ* etc.

**penkʷti-* "set of five, Fünfzahl, Fünfheit" > Old Indic (RV) *paṅktí-* & *paṅtí-* id., also "crowd, flight, herd, group", Pali *panti-* "series", Avestan **paŋti-* reconstructed after *paŋtaŋˇha-* "fünffach".

**pn̥kʷtHó-* "5th" > Indo-Iranian **pakthá-* > Old Indic *pakthá-* (RV x.61.1 *pakthé áhan* "on the fifth day"); Iranian **puxθa-* (with *-u-* after **xsušta-* "6th" or secondary labialized, cf. Avestan *-puxδa-* "cooked", but Khotanese *paha-* id.) > Avestan *puxδa-*, Khotanese *pūha-*. The other forms of ordinals are later and secondary: Old Indic (AV) *pañcamá-* "5th", Gawar *pančama* "on the fifth day" and Middle Iranian **pančama-* (Buddhist Sogdian *pnčm(yk)*, Khwarezmian *pncym*, Ossetic Iron *fænʒæm*, Middle Persian of Turfan *pnzwm*, Parthian *pnǰwm*, Zoroastrian Pahlavi, Modern Persian *panǰom*) are remodelled after **saptama-* "7th"; Old Indic (Kāṭhaka) *pañcathá-* is doubtless secondary in spite of a formal similarity to Celtic counterparts reflecting **penkʷe-to-* (Emmerick 1992a: 181); in *paṣṭha-váh-* "five-year-old steer" an influence of *ṣaṣṭhá-* "6th" is evident.

**penkʷēk̑n̥t-* "50" > Old Indic (RV) *pañcāśát-* f., Pali *paññāsa*; Avestan *paṇčāsat-* f., Khotanese *paṃjsāsä*, Sogdian *pnc's*, Partian *pnǰ'st*, Ormuri *panjāstu*, Pashto *panjōs*, Middle and Modern Persian *panǰāh* etc.; the termination of Ossetic *fænʒai* was influenced by *ævdai* "70", *æstai* "80" (Abaev I: 445). The medial vowel was really **-ē-* (cf. Greek & Armenian). It could not have been caused by the collective marker **-H_2* (Brugmann 1892: 490), because the sequence **-eH_2* would have been **-ā*. In agreement with Kortlandt

(1983: 97–104; cf. also EWAI II: 67), it is possible to assume the following development: **penkʷe-dk̑n̥t-* > **penkʷe?k̑n̥t-* = **penkʷeH₁k̑n̥t-* > **penkʷēk̑n̥t-* > Indo-Iranian **pančāćat-*.

(Abaev I: 478; Debrunner & Wackernagel 1930: 354; Emmerick 1992a: 168–69, 180–81 & 1992b: 298, 309–10, 322; EWAI II: 61, 63–67)

Anatolian:

The only hopeful evidence of the numeral **penkʷe* "5" or its derivative is known from Hieroglyphic Luwian, judging from the phonetic complement of the ideographically written numeral "5": acc. sg. **5**-*wa-sà-pa-* "fivefold" (Meriggi 1962: 165, Id. 1966: 59 & Id. 1967: 138 and tab. 38; Eichner 1992a: 82). Separating a suffix **-as(aᵐ)pa- /*-as(aᵐ)pi-*, probably with ordinal or multiplicative function (Meriggi 1966: 59; Eichner 1992: 93), the initial segment **5**-*w(a)-* can reflect a form of the type **paⁿku* or sim. (Eichner 1992a: 83).

Recently Hawkins (1995: 39–40) presented a promising, although hypothetical identification of the toponym *Tapapanuwa* and the oronym (MONS)IUDEX.QUINQUE, i. e. "(Mount) Five- Labarnas" taken logographically, attested in the hieroglyphic inscriprion of the Sacred pool complex at Hattusa.

Shevoroshkin (1979: 188–89) tried to identify a continuant of the Indo-European "5" in Lycian *pñnuta-* (**pn̥kʷto-* ?), attested in the epitaph from Xanthos: *trijatrbbahi : pñnutahi : uhahi...* "[at the time] of the third day of the fifth year", and in the proper names *Pñnuteh* and Carian *Πανναασσις,-τις* "Quintus" ? (**pn̥kʷtio-*). It is not generally accepted (Melchert 1993a: 55).

The attempt of Bossert to identify the continuant of **penkʷe* or **penkʷto- / *pn̥kʷto-* in Hieroglyphic Luwian *paⁿta* (1950: 123–25; attested e.g. in the text A11c, fr. 16 analyzed by Meriggi 1967: 68; today transcribed *pa-ta₆-à*) was also rejected, cf. already Friedrich 1953: 138, fn. 6.

Armenian:

**penkʷe* "5" > Armenian *hing*. The final **-e* is preserved in the compound form *hngetasan* "15" and the ordinal *hingerord* "5th" (Winter 1992c: 349).

**penkʷēk̑ontH₂* > **finxisun* > **fixisun* > **fiyisun* > **yiyisun* > **yəyəsun* > Armenian *yisown* "50" (Winter 1992c: 353; the origin of **-ē-* was analyzed above). Kortlandt (1994: 255) proposed *yisown* < **hinsun* < **penkʷdk̑omt-*. H. Eichner kindly informed me that *y-* represents an inverse spelling; hence also for "50" the original *h-* can be expected.

Phrygian (?):

**penkʷtā* > **piŋta* > Phrygian female name *Pounta* "Quinta" (?) with a regular development **-in-* > *-oun-* attested in inscriptions; cf. the female name *Πίντη*[ ] from Cilicia (Haas 1966: 146, 170, 208).

Greek:

**pénkʷe* "5" > Greek *πέντε*, Aeolic *πέμπε* ; the same base might be present in the Mycenaean personal names *Pe-qe-u* (Knossos & Pylos) and *Pe-qe-ro-jo* (Pylos).

**pénkʷto-* "5th" > Greek *πέμπτος*; in Gortynian *πέντος* an influence of the cardinal is evident, while Arcadian *πέμποτος* was remodelled after *δέκοτος* "10th".

**penkʷēḱontH₂* "50" > Greek *πεντήκοντα* (the origin of *-ήκ-* was analyzed above).

(Schwyzer 1939: 590, 592; Waanders 1992: 372, 375, 379, 385;)

Albanian:

**pénkʷe* "5" > **penkʷe* + *-ās* (marked plural) or **-om* (neuter collective) > Common Albanian **pêsë* > South Geg *pēs*, Arvanitika (Sophikó of Korinthia) *pésë*, lit. Albanian (Tosk) *pesë*. Traditionally (beginning with Meyer), this numeral has been derived from **penkʷti-*. But it was already Pedersen (1900: 307) who demonstrated the regularity of the change **kʷ* > *s* before front vowels. Huld (1984: 102–03) sought a compromising solution in à merger of two competing forms **penkʷe & *pn̥kʷti-*.

**penkʷeto-* "5th" > Common Albanian **pêsët-* > Buzuku (1555) *hi pesti*, abl.sg. m. *ende e pesët*, Arvanitika (Sophikó of Korinthia) *i pésëti*, Elbasan Tosk (indef.) *ι,ε πέσε τε*.

There is not a common form for "50". E.g. in Arbëresh of Piana (Palermo), four different forms are described: *pesdhjet* (5 x 10), *dizet e dhjet* (2 x 20 + 10), *katrzet e ðjet* (4 x 10 + 10) and even *gims-ḱindje* (1/2 of 100), see Hamp 1992: 884–85.

(Hamp 1992: 835–921)

Illyrian (?):

pn̥kʷtō(n)-/-tio-/ā* "5th" > Illyrian personal names such as ***Pantia* *an. XXIIII Placida ma(ter)* (*CIL* III: 9253), *Fundania* ***Pantia*** (*CIL* V: 1224) etc. and *Dazomenus et* ***Panto*** *filio suo* (*CIL* III: 9024), ***Panto*** *Madoci f. viva* (*CIL* III: 2786), *Aurelia* ***Pantoni*** (*CIL* III: 6349), etc.

(Meyer 1957: 256–57; Mann 1977: v).

Messapic (?):

penkʷe* "5" > Messapic **penke* reconstructed on the basis of proper names: (i) a female name in the inscription from San Cataldo: *deivas* ***penkeos* *teotin̥*[.]*h̥* [... "deae Pompeiaeae Teutinii uxoris" and (ii) a gentilic name in the inscription from Gnathia: *bosat* ***penkaheh*** "Busn̥t Penkaei (uxor)", formally corresponding to Oscan *Pompeius* (Whatmough, *Language* 3 [1927]: 226; Haas 1962: 45–46, 125, 217).

Venetic (?):

**penkʷto-* "5th" > **kʷenkʷto-* > Venetic anthroponym *Kvi.(n.)to* "Quīntō" (a borrowing from Latin *Quīntus* is not excluded, cf. *Qvartio* vs. Latin *Quartius*).

(Vetter, *Glotta* 23 [1935]: 198f; Lejeune 1974: 101–02, 106, 143–44, 338)

Italic:

**penkʷe* "5" > Italic **kʷenkʷe* (assimilation **p...kʷ* > **kʷ...kʷ* and/or alliteration to **kʷetwŏr* "4") > Latin **quinque* (cf. *quique* in *CIL* 6.25962, 10.4407) with a regular change **eŋ* > **iŋ* as in *lingua* etc., most frequently *quīnque* (*ī* after *quīntus* "5th") besides dissimilated *cinque* (*CIL* 6.17508, 10.5939); Oscan-Umbrian **kʷonkʷe* > **pompe*, cf. Oscan *púmperiaís* "quincuriis", Umbrian *pumpeřias*; the *o*-vocalism is also preserved in Oscan *pomtis* "quīnquiēns", representing a contamination of cardinal and ordinal forms.

**pn̥kʷto-* or **penkʷ-to-* "5th" > Italic **kʷenkʷto-* > Latin **quenqutos* > *quīnctus* (*CIL* 1.1215, 6.873, cf. also [*Q*]*ueinctius* – see *CIL* 1.1547) with a regular lenghthening of vowel before *-nc-* + consonant (cf. *jūnctus* vs. *jungo* or *sānctus* vs. *sancio* – see Sommer 1902: 135) > *quīntus*; Oscan-Umbrian **pomptos* > Oscan *Πομπτιες, Púntiis* "Quintius", Paelignian *Ponties*; Umbrian nom.pl. *puntes*, abl.pl. *puntis*, referring to a group of priests, attested in the Iguvinian Tables (III.9,10/III.4), is usually translated "quiniones" (Buck 1905: 86), but Polomé established perhaps a preferable meaning "all" or "the whole group" (1966: 233).

**penkʷedk̂n̥teH₂* "50" > **penkʷedgn̥tā* > Italic **kʷenkʷe?gentā* > Latin **quinquēgintā* > *quinquāgintā* (according to *quadrāgintā* "40").

(Buck 1905: 86; Coleman 1992: 395, 401, 411; Walde & Hoffmann 1954: 407–08; cf. Eichner 1992b: 70–72)

Lusitanian (?):

**penkʷt(i̯)o-* "5th" > Lusitanian **pent(i)o-* in personal names *Penti*[*us*], *Pentouius*, *Pentauius*, *Pentouiecus*, *Pentili*, *Pentilia* etc., ethnonym *Pintones*, toponyms *Pentanes*, *Pintia* etc., besides anthroponyms *Pintamus*, *Pintameus* remodelled after **septamos* "7th" (Schmoll 1959: 47–48; Szemerényi 1960: 71, fn. 15; Tovar 1958: 8; Villar 1991: 461 and 1994: 234–64)

Celtic:

penkʷe* "5" > Celtic **kʷ*[*e*]*nkʷe* > Hispano-Celtic ('Ŕeś'-bronze) *kuekue-* in *kuekuetikui* (de Bernardo-Stempel 1996: 226–27, fn. 69; otherwise Meid 1996: 30); Gaulish **pinpe* in *pinpe-donum*, var. *penpi-dulum* (pinpe-dulum*) "quinquefolium" (Herbarius, see Billy 1993: 120), *Pinpe-dumni*, var. *Pinpe-dunni* 'people from western Pyrenees' (Pliny IV: 108); Old Welsh *pimp*, Middle Welsh *pymp*, *pump*, Cornish *pymp*, Breton *pemp*; Goidelic **kʷonkʷe* > Old Irish *cóic*, Middle Irish *cúic*, Modern Irish *cúig*, Scots Gaelic *coig*, Manx

queig; cf. also Gaulish *πομπέδουλα*, var. *πομπεδουλλά*, *πονγαιδουλα* (!) "πεντάφυλλον" (Pseudo Dioscurides, see Billy 1993: 121), and *POC* "5" attested in the famous Coligny Calendar, reconstructed as **coc* < **conce* < **quonque* by Olmsted 1988: 296, iterpreting this word as an archaic relic of Gaulish language (Sequanian ?) of the Coligny Calendar (cf. the preservation of **k*^{w} in *EQVOS*, *QVTIO & CVTIO*, *QVIMON*). Cowgill offered a revolutionary solution of the problems with vocalism, assuming a starting-point **k*^{w}*n̥k*^{w}*e* (cf. Vendryes 1987: C-143). On the other hand, Schrijver is convinced that the development of **k*^{w}*enk*^{w}*e* > Goidelic **k*^{w}*ink*^{w}*e* > **kwīgwe* > **kūge* > *cóic* is completely regular.

**penk*^{w}*eto-* "5th" > Celtic **k*^{w}[*e*]*nk*^{w}*eto-* > Gaulish *pinpetos* (La Graufesenque; cf. Lambert 1994: 131); Middle Welsh *pymhet*, Cornish *pympes*, Middle Breton *pempet*; Old Irish *cóiced*, having also the meaning "one of five provinces of Ireland" (*cúic cóicidh Érenn*), cf. *cóicedach* "chief of province". It can reflect an old Indo-European heritage in the fivefold organization of the people, cf. Old Indic (RV) *páñca jánās*, *páñca carṣaṇís*, *páñca kr̥ṣṭayas* (Lehmann 1970: 6–7; Crevatin, *Incontri linguistici* 4/1 [1978]: 7–11) and perhaps Hittite *panku-* "all, complete, every" and "multitude, the people, the masses" (CHD 1994f: 88–92), probably also "tribe" (Haudry 1994: 45).

? **penk*^{w}*t*[*i*]- > Celtic **k*^{w}*en(k*^{w}*)ti-* > Hispano-Celtic personal name *Quentianus* (Tovar 1958: 8, 11).

**penk*^{w}*ekont-* "50" > **k*^{w}*enk*^{w}*ekont-* or **k*^{w}*n̥k*^{w}*ekont-* > **k*^{w}*enk*^{w}*ont-* or **k*^{w}*n̥k*^{w}*ont-* > Old Welsh *pimmunt*, Modern Welsh *pymhwnt*, Old Breton *pimmont*; Old Irish *coíco*, gen. *coícat*, Modern Irish *caoga*. Alternatively, Schrijver (1993: 45) proposed *coíco* < **kwãgos* < **kwānk-kont-s* < **pn̥k*^{w}*-komt-*.

(Thurneysen 1946: 246–50; Greene 1992: 509, 511, 515; Vendryes 1987: C-142–44)

Germanic:

**pénk*^{w}*e* "5" > pre-Germanic **fenχ*^{w}*e* (cf. Voyles 1987: 493, fn. 13) > Germanic **fimf* or **fimfi-* > Gothic *fimf*, Crimean Gothic *fyuf* /= *fynf* /; Old High German *fimf* (till Tatian), later *finf* (beginning Otfrid), Old Saxon, Old English, Old Frisian *fīf*, Dutch *vijf*; the vocalism of Old High German (Notker) *funf*, Middle High German *vumf*, *funf* is explained by the influence of the ordinal **fumfta-*, while the umlauted forms, such as Middle High German *fümf*, *fünf*, Modern German *fünf* supposedly represent a contamination of **fumf* and **fimf(i-)* (Ross & Berns 1992: 584–85; on the contrary Szemerényi 1960: 71–73 sees in *u*-vocalism a secondary labialization). The assimilation **fimf* > **fimm* appears in Scandinavian languages: Old Icelandic *fim(m)*, Faeroese *fimm*, Swedish, Danish *fem*.

**penk*^{w}*to-* "5th" > pre-Germanic **fenχ*^{w}*ta-* > Germanic **fimfta-* > Gothic **fimfta-* in *fimfta-táihunda* "15th"; Old Icelandic *fimte*, Faeroese *fimti*, Swedish, Danish *femte*; Old High German *fimfto*, *finfto*, Old Saxon *fifto*, *fifta*, *vîfthe*, Dutch *vijfde*, Old Frisian *fifte*, Old English *fīfta* etc. The *u*-forms as Old High

German **funfto* (1x dat. sg.m. *funftin* in Notker's translation of psalms), Middle High German *funfte*, Swabian *fuft* can reflect the nil-grade **fumfta-* (Brugmann 1892: 472; Ross & Berns 1992: 628), but they are limited only to the Upper German area and can be explained by the secondary labialization (Szemerényi 1960: 72). Similarly, Upper German (dial.) *fuchtsēn* "15", sometimes derived directly from unattested Old High German **fûhto* < Germanic **funχʷta-* (Hirt 1932: 110; Prokosch 1939: 287), reflects more probably an influence of *sechszehn* "16" (Ross & Berns 1992: 600).

**penkʷti-* > Germanic **fimfti-* > Old Icelandic *fimt* "number five; five-day time".

**penkʷedeḱm̥* "50" > Germanic **fimf-tegu-* > Gothic acc. sg. *fimf tiguns*; Old Icelandic *fimm tiger*, Modern Icelandic *fimm tugir* besides Old Icelandic *fimftiu*, Old Danish *fæmtiugh*; Old High German *fimfzug*, *funfzug*, Old Saxon *fīftich*, Dutch *vijftig*, Old Frisian *fīftech*, Old English *fīftig*, dat. *fiftegum* etc.

(Mironov 1963: 348–402; Ross & Berns 1992: 584–85, 616–17, 628)

Baltic:

**penkʷe* "5" > Baltic **penke* > East Baltic **penki* (remodelled according to **keturi* "4" > Lithuanian *keturì*) > Lithuanian *penkì*, Latvian *pìeci*; Yatwingian *pank* (Zinkevičius 1984: 16).

**penkʷto-* "5th" > Baltic **penkta-* > Lithuanian *peñktas*, Latvian *piektais*; Prussian *penckts* (I), *pyienckts* (II), *piēncts* m., *piencktā* f. (III).

(Comrie 1992: 752; Smoczyński 1989:61–108; Stang 1966: 276–85)

Slavic:

**penkʷti-* "5" > Slavic **peⁿtĭ* > Old Church Slavonic *pętь*, Macedonian *pet*, dial. *pent*, Serbo-Croatian *pêt*, Slovak *päť*, Czech *pět*, Polabian *pąt*, Polish *pięć*, Russian *pjat'* etc.

**penkʷto-* or **pn̥kʷto-* "5th" > Slavic **peⁿtŭ* > Old Church Slavonic *pętъ*, Slovak *piaty*, Czech *pátý*, Polabian *pǫtě*, Polish *piąty*, Old Russian *pjatъ* etc.

(Comrie 1992: 752–54; Vaillant 1958: 632–636, 655)

Tocharian:

**penkʷe* "5" > Common Tocharian **p'ənśə* (Winter 1992b: 107 and 1994: 191) > Tocharian A **pāñś* > A *päñ* (Winter 1992b: 109 explains the loss of the expected final **-ś* by sandhi in the sequence **päñś – ṣäk* "5" – "6"); B *piś* (*pīś*).

**penkʷto-* "5th" > Common Tocharian **p'ənkte* > A *pänt*, B *piṅkte*.

**penkʷēk̑n̥tH₂* or *°k̑ontH₂* (Winter) "50" > early Common Tocharian **p'ənśēkənta* > **p'ənśēka* > **p'ən śāka* (*a*-umlaut) > B *p(i)śāka*; A *pñāka* was remodelled after *päñ* "5". Klingenschmitt (1994: 329, 349) reconstructed **penkʷēk̑onts* > **pen[k]ēkōs* > **pän'äk'ā*.

(Van Windekens 1976: 18, 132, 360–61; Winter 1992b: 107–08, 119–20, 135–36)

§2. Reconstruction

The cardinal "5" can be almost safely reconstructed as indeclinable **pénkʷe*. There was an abstract noun **pénkʷtis*, gen. **pn̥kʷtéis* "set of five" (Szemerényi 1960: 114; Eichner 1985: 166). The starting-point for "50" was something like **penkʷe-dḱontH₂* or **-dḱn̥tH₂*. The most problematic is the reconstruction of the ordinal. The form **penkʷto-* with a full-grade vocalism continues in most of languages. The expected zero-grade vocalism (**pn̥kʷto-*) is transparently attested only in Indo-Iranian, but in principle reconstructible in Latin, Goidelic, West Germanic, Slavic and maybe in Illyrian. The "ideal" ordinal **pn̥kʷó-* (Beekes 1995: 214, 216) is not attested anywhere. Szemerényi (1960: 85–92) offered probably the most convincing explanation of the ordinal suffix **-to-* arising from metanalysis of IE **dekn̥t-o-* > **dekn̥-to-* "10th".

§3. Etymology

1. The most popular etymology connects **pénkʷe* with West Germanic **funsti-* (Old High German, Old Saxon *fūst*, Middle High German (Alemannic) *vunst*, pl. *vünst*, Old English *fȳst*, Old Frisian *fest*, Dutch *vuist*), if it is derivable from early Germanic **funχsti-* < **pn̥k-sti-* (Brugmann 1892: 465; Kluge & Seebold 1989: 205). Slavic **pę s tь* "fist" and Lithuanian *kùmstė* id. have been usually quoted as cognates (Saussure 1892: 93). Szemerényi 1960: 114 assumed a variation between the full and nil grades typical for the **-ti-*stems: **penkʷsti-* vs. **pn̥kʷstei-*. Later he reconstructed IE **penk-* "fist" (1990: 237, fn. 10). Let us mention that Latin *pugnus* "fist" can also be related, if it is really derived from **ponkʷnos* (Isebaert & Seldeslachs 1994: 174, fn. 13).

2. Pedersen (1893: 272) found the origin of the numeral "5" in the sequence **kʷetwōres pen kʷe* "four-one-and", proposing **pen-* = "one" and / or "thumb". Fay (1910: 418–19) assumed that the expected, but unattested word for "thumb" was derived from the root **peng-*, continuing in Latin *pinguis* "thick, fat" (**pn̥gu-*), hence **penkʷe* "5" < **penK-* + **-kʷe* "thumb and". Pisani (1929: 41) agreed about the interpretation of **kʷe* as a conjunction (Pokorny 1959: 635–36), while he considered the root **pen-* to have been the proper bearer of the meaning "5".

3. *Fay (1910: 419) and Carnoy (Muséon 59[1946]: 565), followed by* Van Windekens (1982: 11–12), accept the identification of the enclitic copula **-kʷe*, but they connect the root **pen-* with the verb **(s)pen-* "to stretch" (Pokorny 1959: 988; Van Windekens 1976: 360), assuming that the primary meaning was "stretched fingers" > "five".

4. Horowitz (1992: 411–19) tried to prove that the original meaning of **penkʷe* was "hand", and only its incorporation into the numerical system as "5" led to its replacement by other words. To traditionally quoted Germanic **fingra-* (**penkʷró-* ?) he added Greek *πέμπω* "I send, convey", 'developed out of a more specific prototype of "guide on a journey", esp. associated with Hermes as the conductor of the spirits of the dead on their journey to Hades. In this sense the verb may be interpreted as "take by the hand", and so can be

assumed to be a denominative verb based on the root of **pénkʷe'*. The zero-grade can be recognized in *παπάω* "I handle" (**pn̥kʷ-* after Horowitz 1992: 417, fn. 6). In Latin he found cognates in *propinquus* "near" and *pignus* "surety", deriving them from **pro penquelo-* *"before the hand" (so already Fay 1910: 418, fn. 4) and **penkʷnos* *"something left in hand" respectively, cf. Greek *ἐγγύς* "near" and *ἐγγύη* "surety", consisting of *ἐν* "in" & derivatives of *γνῖον* "limb, hand" (l.c. 414–15). Finally, Horowitz assumed an original consonant stem **penkʷ-*, which could also function as a verbal root. Later it was extended in an ordinary *o*-stem. The form **penkʷe* has to be 'simply the case-less stem, the form taken by a noun used outside of a syntactic structure. Such a form was most typically encountered in the so-called "vocative case", but was to be expected likewise when numerals were employed in counting' (l.c., 416–17, fn. 2).

5. Polomé (1968: 99–101) offered an original solution based on Hittite *panku-* "all (of), entire, complete, every, general; multitude, the people, the masses, (worshipping) assembly, congregation, the totality of the king's retinue", cf. *pa-an-ga-u-e* (dat.-loc. used adverbially) "in totality" (CHD 88–92). Quoting suggestive typological parallels from African languages, e.g. Northern Sotho (Bantu) *mphetša* "5", lit. "completion (of counting the fingers of on hand)" or Nama (Central Khoisan) *góro* "5", lit. "whole", he assumed an analogical primary meaning "completion of counting the fingers of one hand".

6. There are more or less promising attempts to find external parallels.

Trombetti (1923: 549) saw a possible external cognate in Uralic **piŋɜ* > Finnish *pivo*, dial. *pi(j)o* "hand, palm of hand, handfull, fist", Estonian *pihu*, *pe(g)o* "palm of hand"; Samoyed **peŋ* "palm of hand" > Nganasan *feaŋ*, Enets *feo*, Nenets (Tundra) *peʔ*, (Forest) *pʹièŋʻ*, Selkup *pīŋga*, Kamasin *pheŋ* (UEV 384; Janhunen 1977: 121).

Cuny (1924: 6–8, 472–73), deriving **pen-kʷe* < **pem-* & **-kʷe*, compared **pem-* with Semitic **ḫam-* (< **fam* !), reconstructed on the basis of Arabic *ḫāmī* "5th", a variant of regular *ḫā mis-*.

Bomhard (1984: 243), starting from the Italo-Celtic form **kʷenkʷe*, separated the root **kʷən-* (sic) and compared it with East Cushitic **ken-* "5" and Chadic **kʷən-* "3" (!). Let us add that this comparison does not appear in the monumental monograph of Bomhard & Kerns 1994.

Schuhmacher (1977: 186–87) proposed that **-kʷe* in **penkʷe* represents a substitution of 'Common Caucasian' **xʷə* "5", reconstructed by Klimov on the basis of Kartvelian **xu(s$_1$)t-* and West Caucasian **(t)xºə*. The author did not try to explain the first part **pen-* of the numeral.

The same author (l.c.) proposed a comparison with 'Tibetan' *pa-nga* "5". It is incorrect, in Classical Tibetan the form *lŋa* is attested, while the forms with the labial **prefix** appear in other Sino-Tibetan languages: Lushai *pa-ŋa*, Trung *pə-ŋa*, Garo, Dimasa *bo-ŋa* etc. (Peiros & Starostin 1996: 136, #501; they reconstruct Sino-Tibetan **ŋāH* "5"). The labial prefix also forms other numerals, cf. Lushai *pa-ruk* "6", *pa-riat* "8" etc.

Starostin (1988: 119) saw in **penkʷe* (< **kʷenkʷe* !) a substratal word borrowed from a source related to East Caucasian, where he reconstructed **χwink'wV* "fist", attested e.g. in Bagvalal *hunḳa*, Akushi of Dargwa *χunḳ*, Archi *χχiḳ* etc. Later he changed the reconstruction into **fimḳwV* (NCED 428).

§4. Discussion

Ad 1. There are also alternative solutions. Hamp (1970: 292–93) assumes an opposite semantic motivation "5" > "fist", deriving the Germanic-Slavic-Baltic isogloss "fist" from the ordinal **pn̥kʷtó-*, hence **pn̥kʷt-ti-* "fist" = "that which is comprised of 5" (the same semantic shift appears e.g. in Kabyle *aḥĕnšim* "fist", representing a borrowing from some Semitic source, cf. Arabic *ḫamsa(t)* "5" – see Vycichl 1951: 202). On the other hand, the attempt of Walde (WP II: 84) and Kluge (1975: 187) to derive the Germanic (and Slavic) "fist" directly from **pn̥sti-* is not acceptable. In this case one would expect German **Funst* (I owe Prof. H. Eichner this note; cf. also Szemerényi 1960: 113, fn. 190). Finally Smoczyński (1989: 71–73 and 1992: 17–23) presented quite different internal etymologies for both the Slavic and the Lithuanian forms. He analyzed **pęstь* as a nomen actionis from the verbal root **peis-/*pis-* "to press" (> **pьxati*) with a nasal infix (cf. Latin *pīnsō* "I stamp, beat down"). Lithuanian *kùmstė* "fist" is a variant of more frequent *kùmštė* (cf. Old Lithuanian *kùmščia,-os*). Smoczyński saw here a deverbative stem **kùmš-ti-*, cf. *pa-kùmšti* "to knock by fist" : *kùmščia* as *nėšti* "to bear" : *nėščià* "gravid woman", and derived it from the verb *su-kunšù*, *-kùšti* "to touch" (cf. Slavic **kǫsnǫti* id.).

If we accept the reconstruction **funχti-*, the Germanic "fist" can be derived from Germanic **faŋχan* "to seize" (Pokorny 1959: 839 and 787–88). Horowitz' reconstruction of the verbal root **penkʷ-*, continuing in the zero-grade in Greek (Etymologicum Magnum) *παπάω* "I handle" (1992: 417, fn. 6), implies that the Germanic "fist" can be a natural derivative just of this verb.

Ad 2. The weakest point of this etymology is missing evidence for the existence of the root **pen-*, regardless of its meaning "one / thumb" or "five", perhaps with the exception of the solution of Fay, connecting the denotation of "thumb" with Latin *pinguis*. The identification "5" = "thumb" implies the counting system beginning with the "little finger" = "1". B. Comrie (1995 ms.) found a convincing representant of this pattern e.g. in the Papuan language Haruai where the following system is described: "1" = *agñöbö* "little finger", "2" = *agñöbö rol-yöbö* "ring finger", lit. "little finger above", "3" = *wölöml* "middle finger", lit. "long [finger]", "4" = *köñö ng-b* "forefinger", "5" = **mömd* "thumb" etc.; similarly in other Papuan languages analyzed by Gvozdanović (1995 ms.), e.g. Kombai: "1" = *raga*, "2" = *ragaragu*, "3" = *wororagu*, "4" = *woro*, "5" = *abalo*, all representing the finger names beginning with "little finger" and ending with "thumb". These typological parallels really allow us to identify "5" = "thumb" < "thick". But they impliy that the

numeral "4" should be based on the "forefinger". Untill now no evidence for this conclusion within Indo-European language family has been provided.

The attempt of Holmer (1966: 21–22) to derive Toch B *päñ* "5" from **pene* without **-k^{w}e* is unconvincing.

The final **-k^{w}e* has been identified with the enclitic copula. But there is an alternative possibility based on the emphatic particle forming some adverbs, e.g. Old Indic *tiraś-cā́* "quer durch", Avestan *tarasča* "durch-hin, über-hinweg", Gothic *þaírh*, Old High Germanic *durh* "through", cf. also Gothic *inu-h* vs. *inu*, *ubu-h* vs. *uf* etc. From this point of view the form **pen-k^{w}e* could represent an adverb *"quite, in totality" or sim., cf. Latin *penitus* "völlig, gänzlich, ganz und gar", Greek *πάνυ* "ganz und gar" etc. (Sabler 1892: 278–79). This interpretation fully agrees with the etymology analyzed sub §3.5 & §4.5.

Ad 3. There are derivatives of the root **(s)pen-* with the meaning "span": Germanic **spannō* and Slavic **pędь* (Pokorny 1959: 988). The "span" means a distance between two fingers, therefore connecting "span" with "five" is problematic.

Ad 4. The solution of Horowitz concerning the puzzling final **-e* in **pénk^{w}e*, namely the "vocative case", cannot be accepted. On the other hand, his identification of the verbal root **penk^{w}-* *"to take in hand, handle" could represent a key to solution. Winter (1989: 35 and 1992a: 15) mentions that the problematic final **-e* is comparable to **-e* of the third person singular perfect. These two ideas are compatible, but with one objection. The Indo-European perfect tense had an accented **-ó-* in the root in the singular, a zero-grade in the plural (Beekes 1995: 237, 239). If we interpret the numeral "5" as the third person singular perfect, we would expect **pónk^{w}-e* ! Although there are some forms allowing this reconstruction (Oscan-Umbrian, Goidelic), they most likely represent results of their internal development. But in the proto-language verbal system, the ending **-e* is also reconstructible for the third person singular in the thematic present characterized by the **-é-* vocalization of the root (Beekes 1995: 228, 233). If we accept the preceding thoughts, the numeral "5" could represent just the thematic present **pénk^{w}-e* "takes, handles, keeps [all fingers ?]" or sim.

Ad 5. The idea "5" = "completion [of fingers of one hand]" was also supported by other authors. Stewart (1906: 238, fn. 3) also found the semantic motivation "5" = "all" in the Shoshonean group. Brock (1972: 272–73) added Toch A *puk* "all, totality", deriving it from **pn̥k^{w}ts*. In spite of her separation of Toch AB *pont-* "all" (< **pen-t-* ?), Schwartz (1992: 423) connected both the stems, deriving the latter from **ponk^{w}t-*. Hamp (1973: 169–70) tried to prove a relationship of Lat *cunctus* "all, whole", assuming the following development: *cuncto-* < **kwonkto-* < **kwenkwto-* < **p$_{e}$nkwto-* < **pn̥Kwto-*, but deriving both the Latin form and Hittite *panku-* from a verbal base **penk-* or **peng-*, different from **pénk^{w}e*. If we accept Polomé's reinterpretation of Umbrian *puntes*, *puntis* as "all, the whole group" (cf. above), it is possible to pro-

pose a common Italic **kwonkwto-*, reflecting **ponkʷto-* with **-o-*vocalism (Meyer 1993: 43). Concerning Greek **παντ-* "ganz, all, jeder" (*πᾶς* < **πάντς*, gen. *παντός*, rare in compounds *παντο-*; Arcadian etc. *πάνσα*, Aeolic *παῖσα* etc.), Schwartz (1993: 423) assumed a hybrid form **pankʷt-*, arising from a contamination **ponkʷt-* and **pn̥kʷt-* > **pakʷt-*. Meyer (1993: 44–45) added Greek *ἅπαξ* "(only) once, once for all", deriving it from **ἅπακυς* < **sm̥-pn̥kʷu-s* "one-all". Ivanov (p.c., Sept 1997) means that Hittite *panku-* is related to Luwian *pūna-* "all" or "totality", *pūnata/i-* "all" (Melchert 1993b: 178–79), cf. the sign HH 430 interchangeable with the syllabic value *pu*, used in the meaning "all" (Hawkins 1995: 25–26). It is perhaps possible to assume the development **pn̥Kwo-* > **pn̥wo-* > **pwn̥(w)o-* > *pūna-* (cf. Melchert 1994: 260–61). Ivanov is also ready to rehabilitate Shevoroshkin's comparison of Lycian *pñnutahe/i-* (see above) with this etymon.

Ad 6. Concerning comparisons with the Semitic or Afroasiatic, Kartvelian, North Caucasian, Sino-Tibetan and Uralic language families, probably only the last one, viz. comparison with Uralic **piŋə* "palm of hand", can be taken seriously. But accepting a common Nostratic heritage, in agreement with the phonetic laws formulated by both Illič-Svityč followed by Moscow school and by A. Bomhard, one would expect **piŋkə* as a regular counterpart to the Indo-European form in Uralic, or on the contrary, to the Uralic form **pengʰ-* in Indo-European (the most natural internal reconstruction of Germanic **fingra-* "finger" is **pengʰro-*, cf. Sabler 1892: 279–80). There is perhaps only possible bridge between hypothetical **pengʰ-* (**pengʷʰ-* or **pengʱ-*) and **penkʷe* "5", namely **pengʰ-* & **-kʷe* (enclitic copula).

§5. Conclusion

Among the etymologies presented in §3 and analyzed in §4, the solutions 4 and 5 look as the most promising. They may not even exclude one another. The meanings "to take, handle, keep" and "to complete, assemble, gather" besides "entirely, all" are doubtless compatible. A suggestive illustration for a similar semantic field can be found e.g. in Arabic *ǧamaʃa* "gathers, keeps together, assembles" with derivatives *ǧamāʃ* "entirely, all", *ǧamʃ* "crowd, assembly; sum, total", *ǧamʃ al-yad* "fist", lit. "total of the hand" (!) besides simple *ǧumʃ* "fist", *ǧumaʃ* "gathering; handful" etc. (Wehr 1958: 121–22; Steingass 1988: 245). It is evident that the meanings "fist" = "total of the hand" or "handful" lead directly to the numeral "five".

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INDO-EUROPEAN "six"

§1. The numeral "6" is common for all branches of the Indo-European language family with exception of the Anatolian branch where no traces of this numeral are known. The attested forms can be projected into the following partial reconstructions, allowing their deeper analysis (the symbol **K* means an unspecified velar; the brackets [..] signalize an uncertain reconstruction; the brackets (..) indicate an alternative reconstruction).

Indo-Iranian:

**Ksweks* "6" > **kṣwaćṣ* is best preserved in Avestan *xšuuaš*. The other forms represent various grades of simplification:

**kṣ(w)ać̣ṣ* "6" > Pashai *ṣha*, Khowar *ṣhoi*; Old Indic *ṣaṭ /ṣaṣ-* (*-ṭ* as in *víṭ* < **viṭṣ* < **wiks*);

**kṣać̣ṣ* "6" > **kṣaḍ* > Pali *cha(ḷ V..)*, Hindi *cha* etc.; Iranian **xšaš* > Khotanese *kṣäta'*, Khwarezmian *'x*, Ossetic *æxsæz*, cf. Sarmatic **ksas* (cf. *Saraksasos* "with six heads" ? – personal name from Olbia); Zoroastrian Pahlavi *šaš*, Modern Persian *šeš*, Kurdic *šäš*, Baluchi *šaš*;

**(-)ṣwać̣ṣ*> **ṣuvaṭṣ* > Prasun *wūṣ(u)* "6", Shina *ṣva*, Ashkun *ṣu*, etc., Gypsy (European) *šov*; Parthian *šwḥ*, Pashto *špaẓ*;

**kwać̣ṣ-* > Iranian **(-)xwaš(-)* > Sogdian (Christian) *xwšw*, (Buddhistic) *wγwšw*, Munjan *åxša*, Yaghnobi *uxš*, Yidgha *uxšo*, Sanglechi-Ishkashimi *xuāḷ* etc.

**Ksuk̂s-to-* "6th" > Iranian **xšušta-* > Avestan *xštuua-* (cf. Hoffmann 1965: 254; **u*-vocalism influenced by Avestan *puxδa-* "5th" ?; Szemerényi 1960: 77, fn. 46 reconstructs **xšvašta-* > **xšaštva-* > *xštuua-*). Hoffman & Forssman (1996: 103) also admit a starting-point **'šta-* corresponding to the Prussian ordinal uschts.

Ksweks-t(H$_2$)o-* "6th" > **kṣ(w)ać̣ṣ-t(H)a-* > Old Indic (AV) *ṣaṣṭhá-*, Pali *chaṭṭha*, Hindi *chaṭṭhā* (a*-vocalism under the influence of Old Indic *pakthá-* "5th").

**Ksweks-mo-* "6th" > **kṣ(w)ać̣ṣ-ma-* > Pali *chaṭṭhama*, Marathi *chaṭham(a)*; Khotanese *kṣei'ma*, Buddhistic Sogdian *wγ šmy(k)*, Parthian *šḥwm* etc.

Ksweks-[d]k̑ṃtH$_2$* "60" > **kṣ(w)ać̣ṣ-ćati* > **kṣaṭ-śati* > **ṣaṭśati* > Old Indic *ṣaṣṭí*, Pali *saṭṭhi* etc.; Iranian **xšwaš-sati* > Avestan *xšuuašti-*, Khotanese *kṣaṣtä*, Khwarezmian *'xyc*, Ossetic *æxsai* (xsac / *xsaʒ*), Ormuri *šūštu*, Pashto *špēta*, Parthian *ššt*, Zoroastrian Pahlavi and Modern Persian *šast* etc.

There is an alternative point of view seeing here an abstract noun in **-ti-*, i.e. **Ksweks-tí-* "Sechsheit" (cf. EWAI II: 681; Hamp 1992: 913; Debrunner & Wackernagel 1930: 369).

(Abaev IV: 233, 223; Berger 1986: 28, 60; Debrunner & Wackernagel 1930: 354–56; Mayrhofer KEWA III: 407–409 and EWAI II: 680–82; Emmerick 1992a: 169, 175, 181 and 1992b 298, 310, 322–323; Hamp 1978: 81–84 and 1983: 102; Szemerényi 1960: 61)

Anatolian:

? > > > Hittite **6**-*az* "6" (Eichner 1992: 52: 617/p II 10'ff. *ma-a-a n* **2**-*az-ma* (11') [**KASKAL**-*az na-as-ma*] **3**-*az* **4**-*az* **5**-*az* **6**-*az* **7**-*az* KASKAL-*az*; cf. abl.sg. *damedaz* "other") (**6**?)-*an* & **6**-*na* "6th" (Eichner 1992: 83).

So far the real form of the numeral "6" in Anatolian is unknown. There are only hypothetical possibilities to interpret similar forms in some non-IE languages as probable borrowings from an Anatolian source:

(a) Hurrian *šeeže* "6" (graph. *še-e-ši-e*) (Wilhelm, *Orientalia* 61, 1992: 134); there are several probable IE / Anatolian borrowings in Hurro-Urartean (Gamkrelidze & Ivanov 1984: 883). On the other hand, a borrowing from Akkadian *ši/eššum* "6" looks more convincingly (Neu 1989: 298, ftn. 12).

(b) Kartvelian **ekŝw-* "6" has been compared with IE "6" beginning with F. Bopp (1847). Now it is generally accepted that **ekŝw-* represents a borrowing from some IE source (Klimov 1967: 308 and 1991: 331).

Considering that there are some mutual borrowings between Kartvelian and Anatolian (Gamkrelidze & Ivanov 1984: 897–898), the latter one could belong among the candidates for the donor language – besides Armenian and Indo-Aryan or even Indo-Iranian. The Indo-Aryan /-Iranian candidature can be supported by the exact correspondence in the initial cluster **Ksw- /*(-)kŝw-* and independently by the Kartvelian **o(ŝ)txo-* "4" (Klimov 1977: 162–163), remarkably corresponding to Indo-Iranian **aćta-* (giving in dual "8"), reconstructed on the basis of Av *ašti-* "four fingers breadth" (Henning 1948: 69).

(c) Etruscan *śa* has been usually translated "4" (cf. e.g. Bonfate 1983: 78–79), although there are serious arguments preferring that it means "6", e.g. the lowest frequency of the numeral "6" in confrontation with "4" and "5" in various languages, corresponding with the lowest frequency of *śa* within the triad *huθ, maχ, śa* representing the numerals "4", "5", "6" regardless of the concrete values (Mańczak, *Glotta* 61[1983]: 103–05), or with the results of the statistical analysis of the age of death, documenting the correlation between the highest frequency of death of quinquagenerians and the numeral *muvalχ*, hence "50", while the second position occupied by sexagenerians indicates the value "60" for *śealχ*, the second most frequent numeral expressing age (Stoltenberg). On the other hand there is an important evidence supporting the identification of the value "4" with the numeral *huθ*, cf. the witness of Stephanus Byzantius..Αὕτη (ἡ Αττικὴ Τετράπολις) πρότερον ἐκαλεῖτο Ὑττηνία (see Oštir 1921: 34; cf. the discussion of Vetter, *Sprache* 8[1962]: 133f). If we accept the meaning "6" for Etruscan *śa*, it is legitimate to think about possible relations to its Indo-European counterparts. It is evident that among the known forms there are no outstanding resemblances. And so independently on the

interpretation of the Etruscan-Anatolian relations (cultural / areal / genetic) the unknown Anatolian forms offer a certain chance.

But there is also a possibility of an internal evidence, namely in Hittite metrology. There are the following length units: *gipessar* ("ell") ≅ 2 *sekan-* ("span") = 12 *waksur*. It means that *waksur* represents one **sixth** of *sekan-*. On the other hand, the term *waksur* also served as a measure of capacity and even of time (Friedrich 1952: 110, 189, 242; Hoffner 1967: 57–58). This polyfunctionality would be natural, if *waksur* was derived from some numeral or fraction, e.g. $^1/_6$ as Latin *sextārius*.

These thoughts are tempting, but they remain on the level of mere speculations.

Armenian:

**sweks* "6" > **-hwec'* > Armenian *vec'* (medially and in sandhi Arm *v* can be derived from **sw*, cf. Hamp 1978: 84–85).

**sweks-[d]ḱ H_2* "60" >> Armenian *vat'sown*; the numeral *veštasan* "16" with the apparently different medial cluster reflects another development – Huld (1997: 129) derived it from a metathesized form **..wesḱ-dekam* > **weš-decam* > **weš-tesan*.

(Kortlandt 1994: 254–56; Meillet 1936: 40; Winter 1992c: 349–352; cf. Pedersen, *KZ* 38[1905]: 229)

Greek:

**sweks* "6" > **wheks* > Dorian (Crete, Delphe, Heraclea) *ϝέξ*, Myc *we-* in *we-pe-za* "six-legged" = **whés-pedya*, Attic *ἕξ*; in sandhi also *ἑκ-* or *ἑσ-*: *ἑκκαίδεκα*, Boeotic *ἐσκεδεκάτε* "16(th)".

**Kse(K)s* (?) > *ξέστριξ κριθή· ἡ ἑξάστιχος*. Κνίδιοι (Hsch.) (cf. Osthoff, *IF* 8[1898]: 13; Chantraine 2: 353 reconstructed **ἓξ-στριξ*, see also Sarmatic **ksas* quoted above); cf. also *ξέστης* "measure of capacity" corresponding to Latin *sextārius* (Chantraine 3: 765).

**swek-to-* "6th" > Dorian (Crete) *ϝέκτος*, Homeric etc. *ἕκτος* (the expected ** -kst-* should have resulted in **-χθ-*).

**sweks-[d]ḱontH₂* "60" > **sweksH₁kontH₂* > **wheksēkonta* > *ϝεξήκοντα* (Argive, Laconian) or *ἑξήκοντα* (the length from *πεντήκοντα* < **penkʷe-H₁ḱontH₂* – see Kortlandt 1983: 98f).

(Lejeune 1972: 134–135; Chantraine 1968–80: 353)

Illyrian (?):

**seḱs-to-* "6th" > **sesto-* > *Sestus* (personal name)

(Hamp 1961: 52)

Albanian:

**seḱs-ti-* f. "6" > **sés-tā* > **gʸiæsta* > *gjashtë*.

(Hamp, *Word* 17 [1961]: 102; Id. 1978: 86–87 & 1992: 913)

Venetic (?):

**sek̑-to-* > **sekto-* + **-yō(n)* > *Se.g.tio* 'Sextius' (personal name from the vase from Cadore).

(Lejeune 1974: 101, 142, 230; cf. also Szemerényi 1960: 77–78, fn. 48, who used the older transcription *Se.x.tio*. Viredaz 1997: 143–44 would prefer to see a Latin borrowing in this name, referring to other borrowed personal names derived from Latin ordinals: *Qvartio*, *Kvito*)

Italic:

**seḱs* "6" > **seks* > Latin *sex*, Oscan **sehs* in *sehsimbriis* "born in the sixth month" < **seksembrios*, cf. Latin *September* < **septumo-mēns-ri-*.

**seḱs-to-* "6th" > **seks-to-* > Latin *sextus*, Umbrian *sestentasiaru* (*Ig.* 3.2) "bi-monthly, i.e. $^1/_6$-yearly" < **sekstent-āsia-som* (Hamp 1978: 86).

**seḱs-*[*d*]*ḱm̥t(e)H₂* "60" > **seks*[*e*]*genta* > *sexāginta* (*ā* according to *quadrāginta*; *i* from *uīgintī*).

(Coleman 1992: 395, 401, 411, 426)

Celtic:

**seḱs* "6" > **sweks* > Old Irish *sé h-* (gen. *sé*^{N}), cf. *seiss-er* "6 men" (*-er* < *fer* < **wīros*), *mór-fess-er* "7 men" = "an increased six men" (cf. Old Indic *mahāpaṅkti-* "seven verse line", lit. "big five" – see Greene 1992: 517–518 < Watkins), Welsh *chwe & chwech* (< **swekse* like **penkʷe*), Cornish *whe & whegh*, Breton (Old) *hue*, (Middle) *huech*, (Modern) *c'houec'h*;

? Hispano-Celtic (Botorrita) *śueś* (Eska 1989: 102–103; rejected by Meid 1993: 116–117); cf. Gaulish proper names *Σουεσ-τάσιον* (Ptolemy, *Geogr.* 2.6.64), *Suessiones* (Caesar, *BGall* 2.3.4.) etc.

**seḱs-o-* "6th" > **sweksos* > Gaulish (La Graufesenque) *suexos* (Vendryes, *BSL* 25 [1925]: 37; Meillet, *BSL* 29 [1928]: 34; Hirunuma 1988: 43 admitted a shortening from **suexetos*).

**seḱs-eto-* "6th" > **sweksetos* > Hispano-Celtic **suesset-* (tribal name *Suessetani* – see Schmoll 1959: 48; he also quoted the personal name *Setus* derivable from Celtic **sextos* < **seḱstos*); Old Irish *sessed*; Welsh *chweched* besides **sweksametos* > Cornish *wheffes*, Breton *c'houec'hvet* (remodelled after **sextametos* "7th" and **dekametos* "10th").

**seḱsu/ā-*[*d*]*ḱomt-* "60" > **seksu/ā-komt-* > **sessu/a-kont-* > Old Irish *sesca*, gen. *sescot & sescat*, dat. *sescait*.

(Greene 1992: 510–511, 515, 539–540; Vendryes 1974: S-59,97)

Germanic:

**seḱs* "6" > **seχs* > Gothic *saihs*, Crimean Gothic *seis*; Old Icelandic *sex*; Old Saxon *sehs, ses* etc.

**seḱ(s)-to-* "6th" > **seχsta-* > Gothic *saihsta*, Old Saxon *sehsta/o*, Old Icelandic *sexti*, Norwegian *sekste* etc. besides **seχta-* > Old High German *sëhto*, Old Icelandic *sétti* (cf. *sétt* "Sechzahl")

(Lehmann 1986: 290–91; Ross & Berns 1992: 585, 617, 628–629)

Balto-Slavic:

**[K]s[w]eḱs* "6" > **[K]seš* > **šeš* > Lithuanian *šeši*, Latvian *seši*; Yatvingian *sziasz* (Zinkevičius 1984: 18–18); Common Slavic **šestĭ* (with the abstract suffix **-ti-* or remodelled according to the ordinal ?) > Old Church Slavonic *šestь*, Serbo-Croatian *šêst*, Slovak *šest'*, Czech *šest*, Polabian *sist*, Polish *sześć*, Russian *šest'*, in 14th-18th cent. gen. *šti* < **šsti* < **šьst°* etc., Slovak obl. *šiest°*, Upper Sorbian *šěsć*, Ukrainian *šist'* < **šēst°*.

(Comrie 1992: 754–55; Hamp 1978: 83–84; Smoczyński 1989: 73–75, 101, fn. 20 reconstructed **s[w]eš* > **š[w]eš* > **šeš* etc., assuming the same development as in Indo-European **sweḱuro-* > Baltic **swešura-* > **šwešura-* > Lithuanian *šẽšuras*; cf. also **swesōr* > Lithuanian *sesuõ*, Old Church Slavonic *sestra*).

If both processes (**Ks* > **(K)š* and **Swe-* > **Se-*) are regular, there is no reason not to accept the original complex cluster **kswe-*. The presence of **-w-* is indirectly confirmed by the ordinal in zero-grade **(-)uḱs-* + *-o-/-to-*.

**([K]s)uḱs-o-* "6th" > **([K]š)uša-* > **ušas* > Lithuanian (dial.) *ušės* "the six weeks of lying-in" (Hamp 1984: 61–63 rejects the traditional view supposing a borrowing from Old Prussian).

**([K]s)uḱs-to-* "6th" > **([K]š)ušta-* > **ušt(a)s* = Prussian *vschts & wuschts*, acc. *vschtan*. Comrie (1992: 755) thought that *-š-* reflects **-sj-* expected in an unattested cardinal (cf. Lithuanian nom. f. *šẽšios*).

**[K]s[w]eḱs-to-* "6th" > Lithuanian *šẽštas*, Latvian *sẹstaĩs* (derived from the cardinals); Old Church Slavonic *šestъ*, Bulgarian *šésti*, Slovak *šiesty*, Czech *šestý*, Polabian *sestě*, Polish *szósty*, Russian *šestój* etc.

(Comrie 1992: 755; Smoczyński 1989: 73–77; Szemerényi 1960: 111 reconstructed the development **(k)seks* "6" > Slavic ***še* and **(k)sekstos* "6th" > Slavic **šestъ*, thus demonstrating the influence of the ordinal on the remodelling of the cardinal)

Tocharian:

**seḱs* "6" > Common Tocharian **šəkəs* > A *ṣāk(k)*, B *ṣkas(s)*, *ṣkass-o*, *ṣkäs(s)*.

**seḱs-to-* "6th" > Common Tocharian **šəkəstV* > A *ṣkäṣt*, B *ṣkaste & ṣkäste*.

**seḱs-[d]ḱm̥tH₂* "60" > Common Tocharian **šəkəska* > B *ṣkaska & ṣkäska*, A *säksäk*.

(Winter 1992b: 108, 120, 137; Hilmarsson 1991: 152 tried to prove that the development **swe-* > A *sä-* is regular; Klingenschmitt 1994: 329 reconstructed *°ḱonts* > **-kōs* > Common Tocharian **-kā* for tens).

§2. Reconstruction:

There are various attempts to reconstruct the original protoform. The following reconstructions represent the minimum (1) and the maximum (5) forms

and their compromise (2) together with their laryngealistic (3), or lateral sibilant (4) reinterpretations:

(1) cardinal **weḱs* vs. ordinal **uḱso-* (Szemerényi 1960: 78 with lit.; Beekes 1990: 255);

(2) **sweḱs* (Brugmann 1892: 476 besides other possibilities; Mayrhofer 1986: 168 quoting also so called Sievers-Lindeman's variant **suweḱs*; Viredaz 1997: 112–50);

(3) **sH₃eḱs* (Erhart 1970: 97–99);

(4) **ŝeḱ^{lh}s* > **s^{w}eḱ^{lh}s* (Gamkrelidze & Ivanov 1984: 845, 849);

(5) **ksweḱs* (Hamp 1978: 87; cf. already Vaillant, *BSL* 44/2[1947–48]: 129) or **ḱsweḱs* (Fay 1910: 419)

§3. Etymology:

There are also some rather outdated etymological attempts; their value is only historical:

(i) Stewart (1906: 242) derived the numeral "6" from the root **seĝ^{h}-* "to overcome" etc. Semantically it is acceptable, but this solution does not explain the presence of **w* at least in some dialects, and the fact that the cluster **ĝ^{h}s* continues in Avestan *ž*, cf. *vazəṇti* "sie ziehen" vs. aor. *uz-uuažaṯ* "fahren", and further Old Indic *váhati* "drives, rides, guides" vs. aor. conj. *vakṣati*, Greek (Pamphylian) *ϝεχέτο* "soll bringen" vs. aor. conj. (Cypriote) *ἔϝεξε* (Mayrhofer *KEWA III: 178 and 1989: 9*).

(ii) Fay (1910: 419) reconstructed **ḱsweḱs*, but he based his analysis on the ordinal **ḱsweḱstho-* < **ksu-eḱs-stHo-* "co-ex-stans", cf. Greek *ξύν* "co-", Latin *ex* "out". It was supposed to designate 'the second thumb'. But the author himself admitted that *ex* originated from **eg^{h}s* (cf. Greek Locr. *ἐχθός*).

Let us analyze the etymologies implied by the reconstructions collected in §2:

(a) Probably the most popular etymology derives the numeral "6" from the root **H₂weks-* "to grow, increase" (Old Indic *vakṣ-* & *ukṣ-*, Avestan *vaxš-* & *uxš-*, Greek *ἀέξω*), consequently "6" = "the increase" after the first "hand" (Szemerényi 1960: 79, ftn. 55; the first proponent of this solution was probably A. Nehring in his course given in Wintersemester 1928–29). Semantically it is fully acceptable, cf. e.g. Beja (Cushitic) *asa-gwəl/r* "6" vs. *gal/r* "1" where *asa-* forms the numerals 6–9. Reinisch 1894: 7, § 145b interpreted it as a participle of the verb *as-* "to be/become/go up". Similarly Dravidian **cāṟu* "6" can be analyzed in **cāl-tu* where **-tu* is the neuter marker and the root proper corresponds with **cāl-* "to be abundant, full, enough" (Andronov 1978: 245) or Umbundu (Bantu) *epandu* "6" vs. *panda* "to proceed, advance, approach" etc. (Hoffmann 1952–53: 65). But there are phonological problems. If we accept the Greek example, traces of the initial laryngeal **H₂* – > Greek *α-* (Beekes 1969: 89) would also be expected in the case of the numeral "6" (***ἀ[ϝ]εξ* ?). Indo-Iranian and Balto-Slavic examples indicate unambiguously the satem reflexes of **-ḱs* differing from the velar in **H₂weks-*, orig.

H_2wegs-, cf. another apophonic grade *H_2eug- > Latin *augeō*, Gothic *aukan*, Lithuanian *augti* etc. (Beekes 1969: 89). Both discrepances imply an incompatibility of **(s)weḱs* and **H_2weks- < *H_2wegs-*.

An alternative solution can be found in Lithuanian *vešėti* "to grow vigorously, thrive; prosper, flourish", *at-vašà & at-ušà* "sprout, shoot", Latvian *atvasa* id. (Fraenkel 1962–65: 23) < **weḱ(s)-/*woḱ(s)-/*uḱ(s)-*, perhaps comparable with Slavic **vysokъ* < **ūḱ(s)-ok-o-* (Smoczyński 1989: 101, ftn. 19; but his derivation of Lithuanian *-š-* & Slavic *-s-* from the clusters **-ks-* or **-gs-* is doubtful; **-ks-* gives Lithuanian *ks* & Slavic **š/x* while **-ḱs- & *-ĝs-* continue in Lithuanian *-š-* and Slavic **-s-*, cf. Lithuanian *láukiu* "I expect", fut. *láuksiu* or Old Church Slavonic *rekǫ* "I speak", aor. *rěxъ*, 3pl. *rěšę* vs. Lithuanian *ašis*, Old Church Slavonic *osь* "axis" < **aḱsi- < *H_2eĝ-si-* , see Vaillant 1950: 84–85).

The unstable **s-* is explained as a result of the influence of the following numeral **septm̥* "7" (Szemerényi 1960: 78; Nehring 1962: 130–131). Following the example from Beja ("one going up"), it is plausible to expect a similar semantic structure. A bearer of the meaning "1" could be just the "movable" **s-*, if the development **sm̥-weḱs* "one grows" > **swweḱs* > **sweḱs* is possible. But it cannot be proved. Perhaps the demonstrative stem **so-* could represent the first member of the syntagm **s(o)-weḱs* "that grows" or sim., but it remains doubtful.

(b) Erhart (1970: 97–99) reconstructed two basic variants which differ only in the order of their components:

**ḱs-H̯e* "3 x 2" and **H̯e-ḱs* "2 x 3"

supposing their mutual contamination or even a merger in their later development. A similar multiplicative principle is rather rare; a good example can be Yukaghir (Kolyma) *ya'loi* "3" vs. *ma'lγiyaloi* "6" where the first component corresponds with *malγur* "on both sides" (Tundra dialect) (Jochelson 1905: 113; Krejnovič 1982: 114–117). The weakest point of this elegant hypothesis is that the meaning "3" of the component **ḱes-* is not attested.

(c) The lateral sibilant **ŝ-* hypothesized by Gamkrelidze & Ivanov 1984: 845, 849 on the basis of the fluctuation **sw/*s/*w* opens an unexpected solution: a borrowing from a source related to North-West Caucasian (=Abkhazo-Adygean) **səxĉə* > Abaza *c-*, Abxaz *f-*, Ubykh *fə*, Circassian *xə* "6" (Colarusso 1994: 17, #76). Let us mention that Nikolaev & Starostin (1994: 219) reconstructed **x̌ʷV*. In this connection Kartvelian **ekŝw-* "six" (Gamkrelidze & Ivanov 1984: 878) analyzed above should also be mentioned. It is probably a borrowing from some early Indo-European dialect (Klimov 1967: 308; Id. 1991: 331).

(d) Sometimes the most complex reconstruction **Ksweḱs* raises fears by its monstrosity (Winter 1992a: 14). But there are further similar creatures among IE etymons, e.g. "tear", "tongue" etc., successfully analyzable as original compounds. Let us try to analyze our **Ksweḱs* in a similar way. Accepting the identification of the component **-weḱs* with the root **weḱs-* "to grow" as discussed above (a), it is natural to seek the sense of the first component **Ks-*.

Probably the first who speculated about "6" as the compoud "hand" & "increase", was Merlingen (1958: 50, 67), reconstructing **xes-weḱs*. His assumption, from the point of semantics undoubtedly plausible, was very sharply criticized (Szemerényi 1960: 79, fn. 55 "M's extravagant assumptions are not helpful"; cf. also Nehring 1962: 129). Their criticism is certainly justified concerning the first component **xes-* postulated by Merlingen. It is really a pure invention without any comparative etymological basis. The same can be said about his comparison of **xes-* with Akkadian *ḫamšu*, *ḫaššu* etc. "5". His last example – Hittite *kessar* "hand" – is more promising, although it cannot be derived from any **xes-*. The generally accepted etymology connects Hittite *kessar* with Luwian *issari*, Lycian *izri*, Armenian *jeṙn*, Greek *χείρ*, Tocharian A *tsar*, B *ṣar* < **ĝʰes-r̥/-ōr* and Old Indic *hásta-*, Avestan *zasta-* etc. < **ĝʰes-to-*. The hypothetical compound would have had the form **ĝʰ(e)s-weḱs*. If we accept the loss of the initial consonant, a "compromise" protoform (2) appears. But there is also **K-* reconstructible in Indo-Iranian, Greek and perhaps Balto-Slavic (if the traces of the initial velar were not caused by the influence of **kʷ* of preceding numeral **penkʷe* "5" in sandhi). The reduced group **ĝʰs* would really give Indo-Aryan **kṣ* and Greek *ξ* [*ks*], cf. Old Indic *váhati* "drives, rides, guides" : aor. conj. *vakṣati* and Greek (Pamphylian) *ϝεχέτο* "soll bringen" : aor. (Cypr.) *ἔϝεξε* (KEWA III: 178). The situation in Iranian is more problematic. The initial cluster preserved in Av *xš* and perhaps Greek *ξ* can probably reflect only **ks* (Beekes 1988: 79), while **ḱs* changes in Avestan *š* (Beekes 1997: 10). On the other hand, **ĝʰs* gives regularly Avestan *ž*, cf. aor. *uz-uuažaṯ* "fahren" (Mayrhofer 1989: 9), but also *š*. cf. *vašata* "er wird fahren" (Hoffmann & Forssman 1996: 96). It is not accidental that *ž* is practically absent in the initial position. Bartholomae (1904: 1717) quoted only *žgar-* "to flow" – a variant of *γžar-* id., besides *žnav-* & *žnu-* "knee" with a variant *(x)šnav-* and *žnātar-* "knower" – a derivative of *xšnā-* "to get to know" – in both cases *x-* is prothetic before the cluster *-šn-* (Beekes 1997: 11). A similar tendency probably appears before the cluster *(-)šm-*: *xšma-* "euch" < **ušmá-* (Hoffmann 1965: 254). The absence of the initial cluster **šuu°* in confrontation with the well documented cluster *xšuu°* implies that also here *x-* is prothetic (Hoffmann & Forssman 1996: 103).

Accepting these rules, the assumed starting point **ĝʰs-weḱs* could changed into **kseḱs* continuing in (some) historical records, perhaps via palatal dissimilation through**gʰsweḱs*, in agreement with the rule not allowing the presence of two occlusives of the some series in the same root / stem (Gamkrelidze & Ivanov 1984: 18, 96–98). The change **gʰs* > Avestan *xš* (and Old Indic *kṣ*) is documented, cf. *gah-* "toeat" vs. reduplicated perf. *jaxš-* (Hoffmann & Forssman 1996: 234)

§4. External parallels:

There were also attempts to find external parallels. Some of them were discussed above (see the Anatolian section). They probably represent Indo-

European borrowings in some neighboring languages. It remains to analyze the remarkable similarity between some Indo-European forms (Old Indic nom.-acc.-voc. *ṣáṭ*, instr. *ṣaḍbhís* "6", *ṣoḍhá* "sechsfach", Lithuanian *šeši* "6") and their Semitic counterparts (Arabic *sitt* "6", *sādis* "6th", Hebrew *šēš* "6") – see e.g. Møller 1909: 117 and already Šafařík 1848[65]: 634; recently also Dunant, *Archív Orientální* 56[1988]: 353. But if we compare the reconstructions, specifically Indo-European **Ksweks* (< **ĝʰ(e)s-weks*) and Semitic **šidṯ-*, their incompatibility is evident.

§5. Conclusion:

In spite of certain phonetic problems the modified etymologies (a) and (d) leading to the primary form **ĝʰ(e)s-weks* "hand-overgrowing" seem to be the most promising.

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INDO-EUROPEAN "seven"

For Professor Karl Horst Schmidt to his 70th birthday on May 31, 1999

§1. The numeral "7" is well attested in all branches of Indo-European languages. The most important forms of this numeral and its basic derivatives can be projected into the following partial reconstructions allowing their deeper analysis.

Indo-Iranian:

**septm̥* "7" > Old Indic *saptá*, Pali *satta* (cf. "Mitanni-Aryan" *šatta* in Kikkuli's text), Hindi etc. *sāt* ; Kati *sut*, Waigali *sōt*, Ashkun *sūt*, Prasun *sëtë*, Khowar *sot*, Kashmiri *sath* etc.; Avestan *hapta*, Khotanese *hauda*, *hoda*, Pashto *ōwa*, Sogdian *'βt(')* = **avd*, Yaghnobi *avd*, *aft*, Alanic *αβδα* [in *'Αρδάβδα* , lit. "(city) of seven gods", the proper name of the city of Theodosia], Ossetic *avd*, Yidgha *ávdo*, Shugni *(w)ūvd*, Wakhi *hūb* etc., Parachi *hŏt*, Zoroastrian Pahlavi, Modern Persian *haft*, Kurdic (Kurmanji) *ḥāvt*, Baluchi *apt* etc.

**septm̥mó-* (perhaps *°m̥* + *-ó-*) "7th" > Old Indic (AV, YV and exclusively in classical Sanskrit) *saptamá-*; Khotanese *haudama-*, Khwarezmian *'βdym*, Sogdian *'βtm(yk)* = **avdamīk* (cf. personal names *'Αφθάμακος*, *'Αφθείμακος* known from Tanais – see Abaev 1979: 290), Ossetic Iron *ævdæm*, Parthian *hftwm*, Zoroastrian Pahlavi *haftom*, Modern Persian *haftum*.

**septm̥t(H)o-* "7th" > Old Indic (only RV) *saptátha-*; Avestan *haptaθa-*. Emmerick (1992a: 182) sees in *saptátha-* the secondary form based on a reinterpretation of *ṣaṣthá-* "6th" as a cardinal plus suffix *-thá-*. Elsewhere he differentiates the Indo-Iranian suffixes **-tha-* : **-ta-*, interpreting them as the specific opposed to the general respectively (1992b: 323). Schmidt (1992: 198) takes into account the identity of the suffix of the Old Indic ordinals "4", "5", "6", "7" and of the superlative, assuming their common pronominal origin.

**septm̥tí-* "70" (orig. "Siebenheit"; cf. Debrunner & Wackernagel 1930: 369, 419; Mayrhofer 1996: 681 for *ṣaṣṭí-* "60") or **septm̥-(d)ḱm̥tH₂* > **saptắćati-* (cf. Szemerényi 1960: 60, 62) > Old Indic *saptatí-*; Avestan *haptāiti-* (but *haptaiθiuuaṇt-* "seventyfold"), Khotanese *haudātā*, Manichean Sogdian *'βt't*, Khwarezmian *'βd'c*, Pashto *awiā*, Ormuri *awaitu*, Middle Persian (Turfan) *hpt'd*, Zoroastrian Pahlavi, Modern Persian *haftād* etc.

(Abaev 1958: 82–83, 196–197; Bailey 1979: 498–499; Berger 1986: 29; Emmerick 1992: 169–170, 175, 181–182; Id. 1992b: 299, 310, 323; Mayrhofer 1976: 431; Id. 1996: 700; Morgenstierne 1927: 13).

Anatolian:

**septmiyo-* or **septm̥-yo-* > Hittite *siptamiya-* "a liquid consisting of seven ingredients", cf. 3-*ya-al-la* 7-*mi-ya šipantanzi* doubtless corresponding to *ši-ip-ta-mi-ya te-ri-ya-al-la šipandanzi* "sie libieren *siptamiya* und *triyalla*", i.e. liquids consisting of seven and three ingredients resp. (Kronasser 1966: 169, 365). Eichner (1992: 85) explains the change **e* > *i* by *i*-umlaut. He finds a formal parallel concerning **-(i)yo-* extension in the Roman name *Septimius*. The form *siptamiya-* is a derivative of an original ordinal **siptama-* < **septmó-* (Eichner 1992: 84; let us mention an alternative reconstruction **septm̥mo-*). The unextended *o*-stem is probably preserved in the Cappadocian female name *Ša-áp-ta-ma--ni-ga*, which has been interpreted as "the seventh sister". The *a*-vocalism most likely indicates a Luwian source, cf. Luwian *sap(pa)tammimma/i-* "sevenfold" (??), interpreted as a participle of an unattested denominal verb *sa(pa)tammiya-* "to multiply by seven" (Melchert 1993: 188). Shevoroshkin (1979: 190) tries to add Milyan *sẹjtamiu*, attributive to *qirzẽ* (acc. sg.) "share", identifying it on the basis of other attributes *tbiplẽ* "double" and *trpplẽ* "triple" with Hittite *siptamiya-*. The irregular change **-pt-* > *-jt-* can be explained by the influence of *aitãta* "8".

septm̥(t-)* >[se/ipt]an-* > Hittite *7-an* "7" (Eichner 1992: 83–84).

Armenian:

**septm̥* "7" > Armenian *ewt'n*. In the variant *eōt'n* < **eawt'n*, a contamination of *ewt'n* and the dialect form **awt'n* may be suspected (Winter 1992c: 350). Kortlandt (1994: 254) prefers to see in it "..a reduced grade vowel, which replaced zero grade vocalism in the ordinal and was later introduced into the cardinal."

**septm̥-(d)ḱontH₂* "70" > **ewt'an-sown* > **ewt'asown* > Armenian *ewt'anasun*. Winter (1992b: 352–353) assumes that *-n-* was introduced from "7" and the cluster **-wt'n-* was reduced in complexity by an inserted *-a-* before *-n-*. Kortlandt (1994: 255) saw in *-asown* (also in *k'arasown* "40") a phonetic reflex of **dḱont-* (he reconstructs **dḱomt-*) after a syllabic resonant.

Greek:

**septḿ* "7" > Greek *ἑπτά*.

**septmo-* "7th" > **sebdmo-* > Ionian-Attic *ἕβδομος* (with *-o-* inserted under the influence of *ὄγδο(ϝ)ος* "8th" ?), Delphian, Cyrenaean, Aetolian *ἕβδεμος* (*-ε-* is puzzling – see Waanders 1992: 380). Szemerényi (1960: 8, 12, 93) reconstructed a different development: **septm̥mos* > **ἑπταμος* > **ἑβδαμος* (with *-βδ-* after "70") > *ἕβδομος* (with *-o-* after "8"). The Homeric alternative form *ἑβδόματος* perhaps follows *τέτρατος* (besides *τέταρτος*) "4th" < **kʷetr̥-to-* similarly as *τρίτατος* "3th".

**septm̥-dḱontH₂* "70" > **septm̥H₁ḱontH₂* > **ἑβδμήκοντα* > Greek *ἑβδομήκοντα*, Delphian, Heraclean *ἑβδεμήκοντα* (Waanders 1992: 375, following Kortlandt 1983: 98–99; Beekes 1995: 214 accepted the originality of *-a*

< *-H_2 as against Kortlandt & Waanders). Sommer (1951: 23) opined that *-ḗ-* was introduced through "60" from "50". Kortlandt l.c., starting from the glottal theory, explained *-ήκοντα* in *πεντήκοντα* "50" by compensatory lenghtening as follows: **penkʷe-dk̂ont-* > **penkʷe-'kont-* > **penkʷe-H_1kont-* > **penkʷeekont-* > **penkʷēkont-* (cf. also Waanders l.c.).

Dacian:

septm̥* > Dacian **sipta & -āk(o)s* > **siptoax* > *sipotax & sipoax*; cf. Pseudoapuleius 1: "A Graecis dicitur arnoglossa, alii arnion, alii probation, alii einoglossa, alii *eptapleuron* (= ἑπτάπλευρον after Dioscurides), Galli tarbidolotius, Spani tetharica, Siculi polineuron, [alii] tirsion, profetae ura egneumonos, Aegyptii asaer, alii thetarion, Daci **sipoax (var. **scinpoax, simpeax, sipotax**), Itali plantago maior, alii *septenervia*" (Detschew 1957: 560; Georgiev 1977: 196–197; as a formal parallel in word formation he quotes Bulgarian *sedmák* "seven years old animal").

Albanian:

**septm̥-ti-* > **septá-ti-* > **se(p)tá-tā* (the replacement of **-ti-* suffix forming numeral abstracts by **-tā* > *-të* – see Hamp 1992: 912) > **š(ë)tá-të* (the form *šët-* is preserved in Lakonia and Triphylia Arvanitika in *e šëtúnë* "Saturday", normally *e shtunë* – see Hamp 1992: 894) > Albanian *shtatë* "7" (Hamp 1992: 914). Mann (1977: V) finds in the Illyrian (?) proper name *Stataria* a possible reflex of pre-Albanian numeral "7".

Italic:

**septm̥* "7" > Latin *septem*.

**septm̥mo-* (from °*m̥* + *-o-*) "7th" > Latin *septimus*, earlier *septumo* (*CIL* 1.2519). Cf. also the personal names reflecting **septm̥-yo-*: Latin *Septimius*, Marsian *Setmiu]s*, *Setm[ius* (Slunečko 1992: 89).

**septm̥-dk̂m̥teH$_2$* "70" > **septm̥-dĝm̥teH$_2$* > **septm̥H$_1$gm̥teH$_2$* > **septmāgentā* > **septumāgintā* > Latin *septuāgintā*.

(Coleman 1992: 395–396, 401–402, 411–412).

Celtic:

**septm̥* "7" > Goidelic **sextem* > Old Irish *secht*^{N}; Gaulish-Brythonic **sextam* (with irregular **s-* instead of expected **h-*) > Middle Welsh *seith*, Cornish *seyth*, *syth*, Breton *seiz*; Gaulish *sextaN* in *Pagus Sextan-mandu[us]* (*CIL* XIII 3149 – cf. Lambert 1994: 132).

**septm̥-eto-* "7th" > Gaulish (La Graufesenque) *sextametos* (< **sextam* + **-etos* after *pinpetos* "5th"), Middle Welsh *seithvet*, Cornish *seythves*, Breton *seizved*; Old Irish *sechtmad*. The expected Celtic ordinal **sextamo-* can be reflected in the Hispano-Celtic place name *Siétamo* (Schmoll 1959: 48).

**septm̥mo-(d)k̂onts* "70" > Old Irish *sechtmogo*.

(Thurneysen 1946: 250; Lewis & Pedersen 1954: 235, 239; de Bernardo Stempel 1984: 140; Greene 1992: 510, 515, 540).

Germanic:

**septm̥t* "7" (with *-t* after the ordinal **septm̥to-* ?) > **sepm̥t* > Germanic **seβun* > Gothic *sibun*, Crimean Gothic *sevene*; Old High German *sibun*, Old Saxon *sibun*, *sivon*, Old Frisian *sigun*, *sôgun*, *sowen* etc., Old English *seofo(n)*, *seofun*, *siofu(n)*, *sifu* etc.; Old Icelandic *sjau*, Old Swedish *sjū*, Danish *syv* etc.; the preservation of *-t-* in *septun* (Lex Salica) is explained by Latin influence. Hamp (1952: 138) assumed the following development: **septm̥* : **septm̥to-* > early Germanic **seftu* : **siβunðaz* and after leveling of cardinal on analogy to ordinal **siβun* : **siβunðaz*. Szemerényi (1960: 35) proposed an original solution, explaining the loss of **-t-* by a metathesis **seftun-* > **sefunt-*.

**septm̥to-* "7th" > Germanic **seβunða-* > Old High German *sibun*, Old Saxon *siβondo*, Old Frisian *sigunda*, Old English *seofoþa*; Old Icelandic *sjaundi*, Old Swedish *siundi* etc.

**septm̥-dék̂m̥t-* or *-dék̂m̥t-* "70" > Gothic *sibuntehund* (Ross & Berns 1992: 609).

Among other explanations (cf. Lehmann 1986: 301; Shields 1992), the solution of Szemerényi (1960: 33–35) is undoubtedly the most sagacious: **septm̥kont-* > **seftunχanþ-* > **seftunhund* (after the operation of Lex Verner and the influence of **χunþan* "100") > **seftunēhund* (after **fimfē-hund* "50") > **sefuntēhund*.

**septm̥-dék̂m̥* "70" > Germanic **seβun-tegu-* > Old Saxon *sibuntig*, Old High Germanic *sibunzug*, *sibinzig* etc. Old Icelandic *siau tiger*, Old Danish *siutiugh*, Old Swedish *siutighi* etc. (Ross & Berns 1992: 602–609, 617).

The specific reconstructions **dék̂m̥* and **dék̂m̥t* are explained elsewhere. The other, more complicated forms (Ross & Berns 1992: 618) are not important for our purpose when studying the numeral "seven".

Baltic:

septm̥* "7" > Baltic **septin* + *-yo*-flexion > East Baltic **septīn-ia-* (-ī-* after **-ō-* in the following numeral *aštuoni* "8" – see Stang 1966: 279) > Lithuanian *septyni*, Latvian *septiņi*, dial. *septîņi* (Smoczyński 1989: 84 assumed a change *-i* < **-ī*, quoting Old Lithuanian *patì* "wife, female" < **patī*, cf. Old Indic *pátnī* "lady" – pp. 98–99, fn. 15). Yatwingian *geptiſ* "7", correctly probably **ſeptiſ* (Zinkevičius 1984: 12), can reflect **septins*.

**septmo-* > Baltic **septma-* > Prussian *septmas* (II, III 1x), f. *septmai* (III, 1x), *sepmas* (III, 1x); East Baltic **setmas* > Old Lithuanian *sẽkmas* (the substitution **-tm-* > *-km-* can be illustrated e.g. by *šálkmėtės* "mentha piperita" < **šálk-mėtės* or by *áukmonas* "boss" < German *Hauptmann* – see Smoczyński 1989: 84), *Sekmìnės* "Whit, Whitsunday" (Fraenkel 1962–65: 772). Smoczyński l.c. starts from **septm̥mo-* "7th" > Balto-Slavic **septima-* (or **septuma-*), syncopated in **septma-*.

**septm̥to-* "7th" > East Baltic **septinta-* (after **devinta-* "9th") > Lithuanian *septiñtas* (an innovation appearing only in the end of 18th cent.), Latvian *septîtaĩs*.

Slavic:

**septmo-* "7th" > pre-Slavic **sebdmŭ* > West & South Slavic **sedmъ* & East Slavic **semъ*. The cardinal **sedmь* was remodelled after the ordinal **sedmъ* which replaced the expected, but unattested ***setь* or ***setę*, a regular continuant of Balto-Slavic cardinal **septin* (Lamprecht 1987: 121–122). Comrie (1992: 756–757) offered an alternative solution consisting in coalescence of cardinal **setь* < **septin* < **septm̥* and ordinal **semъ* < **septmo-* , giving **setmъ* > **sedmъ*. The unique Kashubian forms *sėtãm, sėtmə* with voiceless *-t-* are explained as a result of regular devoicing before *-m̥* (Comrie 1992: 756).

Tocharian:

**septm̥* "7" > **śəpət(əN-)* > A **ṣäpt(äN-)* > pl. *ṣäptäntu*, in compounds *ṣäpta-*, after metathesis *ṣpät*; B **ṣäwät* > **ṣwät* > **ṣut* > *ṣukt* after *okt* "8" (Winter 1992b: 109). Van Windekens (1976: 461) presented a traditional explanation of the B form: **septm̥* > **ṣäptäm̥* > **ṣäptu* > **ṣäktu* (after **aktu* > *okt* "8") > **ṣukt*.

**septm̥to-* "7th" > **śəpətəNtV* > A *ṣäptänt*, B *ṣuktante* & *ṣuktänte* (Winter 1992b: 137–138; he notices a formal identity of Lithuanian *septiñtas*).

**septm̥-(d)ḱm̥tH₂* "70" > **śəpətəNka* > A *ṣäptuk* (with *-u-* after *oktuk* "80"), B *ṣuktaṅka* (Winter 1992b: 121) or **-(d)ḱonts* > **-kōs* (Klingenschmitt 1994: 329, 404).

§2. Reconstruction and etymology

2.0.The preceding analysis confirms the traditional reconstruction of the indeclinable cardinal **séptm̥* (Beekes 1995: 215; the accent shift in Aryan-Greek-Albanian-Germanic **septḿ* reconstructed by Brugmann 1892: 478, was probably caused by the influence of the numeral "8" – see Debrunner & Wackernagel 1930: 356 with older literature; Schwyzer 1939: 590), and of the ordinal **septm̥mó-* (and / or **septmó-*, probably both the forms from **septm̥-* + the ordinal suffix *-ó-* , cf. Schmidt 1992: 211–12). The other reconstructions do not respect the facts, e.g. **sepńt* is acceptable only for Germanic (Voyles 1987: 492; cf. also Shields 1992: 89, 97). In his reconstruction **sequdm̥* < **seque* "apart" & **duō* "2", Mann (1984–87: 1129–1130) assumed a change k^w > *p* not only for *p*-Celtic, Osco-Umbrian and post-Mycenaean Greek, but for all Indo-European branches!

There are more etymological attempts:

2.1. Fay (1910: 420–22) derived the numeral "7" from the root **sap-* "to taste" (Pokorny 1959: 880), explaining the semantic motivation "7" = "[right] forefinger" = "taster", cf. Greek *λιχανός* "forefinger", lit. "licker", Lithuanian *ližius* id. (Pott 1847: 288, 292). Although the semantic aspect of this etymol-

ogy is plausible, there are serious problems in phonology and morphology. The late Indo-European vowel *-*a*- probably reflecting *-*H*- is hardly compatible with *-*e*- in the numeral "7". And how to understand the termination in *-*tm̥mo*-, i.e. a superlative, together with a presumed meaning of the seventh finger, a "taster" ? The author's alternative solution based on the root attested in Latin *sōpio* "mentula", and Old Indic *sápa*- id. plus superlative belongs rather in the sphere of pornography...

2.2. In spite of the tempting possibility that in the final *-*m̥* the accusative of the consonant stem **sept*- ("heptad" ?), or only of the root **sep*- + *t*-suffix may be identified, the numeral "7" remains etymologically unanalyzable (Winter 1992a: 12; the attempt of Schmid 1989: 13–14 to see here a *-*ti*- derivation from the root **sep*- with the original meaning *"Pferde mit Hand und Zügel zusammenhalten", cannot be accepted for semantic reasons; similarly already Stewart 1906: 243).

2.3. In the first version of this chapter, the following conclusion was proposed (Blažek 1997: 21): "It is very difficult to analyze the cardinal **septm̥* from the point of view of Indo-European 'Stammbildung'". But this rather pessimistic point of view is not quite valid for the ordinal **septm̥mo*-. If we segment this formation into **sep*- & *-*tm̥mo*-, in the latter part the superlative can be identify (cf. the detailed discussion of this problem presented by Cowgill 1970: 117–18, 146–47). It remains to explain the function of the root **sep*-. There is essentially only one possible etymon in the Indo-European lexicon, namely **sep*-, reconstructed on the basis of Old Indic *sápati* "fosters, seeks for, caresses, deals with, honours, respects", Avestan *hap*- "halten, hegen", Greek *ἕπω* "besorge, betreibe, verrichte". Pokorny (1959: 909) proposed the primary semantics "sich in etwas abgehen, in Ehren halten". This latter meaning may represent a key to the semantic motivation of the numeral. The solution **septm̥mo*- (or °*m̥Ho*- after Beekes 1995: 199) = *"the most honorable", corresponds to the prominent position of the numeral "7" among Indo-Europeans (this idea could be borrowed from the Semitic world). The creation of the cardinal **septm̥* can be desribed as the 'ordinal' minus the 'ordinal suffix *-*ó*-', fully in agreement with the cardinal / ordinal opposition characterizing other numerals.

Despite of the quoted solutions (and numerous other attempts – see Debrunner & Wackernagel 1930: 356) none of the etymologies is fully satisfactory. Studying the systems of numerals in various language families, I am convinced that it is almost always possible to determine an original motivation of all higher numerals beginning with "5". For the case of a missing etymology the following rule can be formulated: If a numeral *x* in a language *A* has no hopeful etymology and there is a similar numeral *x'* in a neighboring language *B* where *x'* is analyzable, the question of the borrowing *x* < *x'* is quite legitimate. It is remarkable that the numeral "7" in most language families in the neighborhood of Indo-European languages really resembles the form **septm̥* analyzed in §1.

§3. External parallels

A. Uralic languages

a) Fenno-Permic **śeńćemä* (Joki 1973: 313; Rédei 1988: 773), **śe(e)śĺćVmi* (Sammallahti 1988: 553), **śejććem* (Honti 1993: 100–102; he also admits **s-*), **śeć(ć)em(ɜ) > *śēćem(ɜ) > *śejćem(ɜ)* (Napolskikh 1995: 126):

Balto-Fennic **sejććen*, **sejććemä-* (after Honti 1993: 102) > Finnish & Ingrian *seitsemän*, dial. *seitsen*, Carelian *seittšemen*, *seittšimä*, *seitšen*, Olonets *seiťťše(i)*, Weps *seitšmen*, *seičmen*, Wote *seitsē*, gen. *seitsmē*, Estonian *seitse*, gen. *seitsme* etc.

Lappic **ćēćęm* > Inari *čiččam*, Norwegian *čieǯâ*, Notozero *čihčem* etc. (Lehtiranta 1989: 24).

Mordvin **śiśəm* (Keresztes 1986: 143).

Merian **śeŻum / *śiŻum* (Tkačenko 1989: 121).

Mari **šišəm* (Bereczki 1992: 61–62).

Permic **śiźim* (Lytkin & Guljaev 1970: 255).

The numeral has no hopefull internal etymology. In agreement with the rule formulated in §2.3 it is natural to seek its source outside Fenno-Permic languages. Among the Indo-European branches in contact with the Fenno-Permic languages, there are two candidates (already Serebrennikov 1963: 221 thought about some Balto-Slavic source):

i) Baltic: Old Lithuanian *sẽkmas* "7th" allows to speculate about the source of the type **sekma- > *seḱema- > *śeć(ć)em*. The hypothesis of an East Baltic origin can be supported by the existence of Baltic hydronymy on a vast area between the Baltic sea and the Volga and by the presence of Baltic borrowings not only in the Fenno-Volgaic languages but also in the Permic branch (Gordeev 1985: 113f).

ii) Slavic: Tkačenko (1989: 121) and Napolskikh (1995: 125–126) saw the origin of the Fenno-Permic numeral "7" in Slavic, but it is evident that the hypothetical source cannot be East Slavic **semь*. It should be a form very close to **setmь* discussed above, perhaps better with a fill-vowel **setьmь* (cf. Comrie 1992: 757), which had to be transformed into ***śet'čĭmĭ* (Napolskikh l.c.). The closest parallels in Slavic could be Kashubian *sėtäm*, *sėtmə* and maybe the Polabian ordinal *stdim*. The earliest contact of the Slaves and Fenno-Permians indicated by archeology is dated to the end of the 4th cent. A.D. (Sedov 1994: 8). A direct contact of these first Slavic immigrants to the North with the basin of middle Vistula is also attested (Sedov 1994: 10; cf. Zaliznjak 1988: 176 concerning the linguistic evidence). The main problem remains in chronology. The end of the 4th cent. A.D. is too late for any influence on the common Fenno-Permic proto-language. Sammalahti (1988: 520) put it between the disintegration of the Fenno-Ugric proto-language (3500–3000 B.C.), and the introduction of the Battle Axe culture (2500–2000 B.C.). The only solution would be an independent influence of an early Slavic dialect (or more dialects) on the Fenno-Permic branches, including the possibility of mutual borrowings among them.

iii) The hypothesis of Ross (1941: 1), reconstructing the borrowed Indo-European archetype in the form **s/šeḱstɱ*, a mixture of the numerals "6" and "7", should be also taken into account.

b) Ugric **säptä* or **sə̄ptä* (Joki 1973: 313), **θäptɜ* (Rédei 1988: 844; Honti 1993: 103), **Säpt* (Napolskikh 1995: 124; the symbol **S* is used for incompatible **s/š* > proto-Khanty **θ* & Hungarian *∅* and **ś* > proto-Mansi **s*) > Ob-Ugric **θääpet* (Sammallahti 1988: 504), **θə̄pət* (Honti 1982: 138) > Khanty **ʌə̄pət* (Honti 1982: 138); **ʌ-* < (Ob-)Ugric **θ-* < Fenno-Ugric **s-* & **š-*. The corresponding sound to Khanty **ʌ-* is Mansi **t-*, but there is Mansi **sə̄tɜ* (Honti 1982: 138), where **s-* reflects Fenno-Ugric **ś-*. In Hungarian one would expect **ét*. The really attested form *hét* has its unetymological *h-* under the influence of *hat* "6".

Traditionally the donor-language has been sought in Iranian (Korenchy 1972: 70; Joki 1973: 313 with lit.). But Iranian **hapta* could have been a source only for Hungarian. The protoform **θäptɜ* common for Khanty and Hungarian with **θ-* < **s-* (or **š-*), apparently resembles better the Indo-Aryan / Indo-Iranian form **sapta* (cf. Abaev 1981: 85, 89, who rejected the speculations about "early Iranian", preceding the typical Iranian change **s* > **h*). There are more borrowings, esp. in Ob-Ugric, bearing typical Indo-Aryan features, e.g. Mansi LM *šäšwė*, T *šīšė·ŋ* "hare" vs. Old Indic *śaśá-*, Phalura *šašīak* etc., but Avestan **saŋha-*, Khotanese *saha-* etc. id. (Blažek 1990a: 42). The expected cultural contact can be localized in time and space: the bearers of the Andronovo cultural complex, very probably speakers of an early Indo-Aryan language ("Sauma-Aryans" according to Parpola 1994: 156), or even of an Indo-Iranian (Kuz'mina 1994) dialect, and the proto-Ugrians were neighbors in the contact area of southern Siberia during the 2nd mill. B.C. But the Indo-Aryan hypothesis does not explain the different Mansi anlaut (*s-* < **ś-*).

For the vacillation between **θ-* < **s-/*š-* and **s-* < **ś-* within Ugric, an alternative solution can be found in the hypothesis of a Tocharian origin (cf. Joki 1973: 313 "..Zur Klärung des letzteren [= Mansi *s* < ** ś*] kann toch. */ṣäptä-/* wohl nicht herangezogen werden: toch. A *ṣäptänt-* "siebenter"; Janhunen 1983: 120 said: "..an early Proto-Iranian source is normally assumed [for the Ugric "7"], but the phonological details could perhaps be better explained by the assumption of a Proto-Tocharian origin"). Napolskikh (1995: 124–125) reconstructed the consonant stem **Säpt* for the Ugric numeral "7", following Xelimskij (1979: 121, 125). He also prefers to see in it a borrowing from the ancestors of Tocharians. Proto-Tocharian **śəpət* "7" (Winter 1992b: 109; see above) really appears to be a more probable source of both Ugric forms for "7" than Indo-Aryan **sapta*. Concerning the other evidence of the Tocharian-Ugric connections, cf. Ivanov about phonological paralelism (1986: 11–14) and Napolskikh, summarizing the Tocharian – Fenno-Ugric parallels (1994: 37–39). Napolskikh tried to identify the Tocharian influence with the so-called Seima-Turbino archaeological phenomenon (17–16th cent. B.C.), deriving it from the Afanasievo culture (Napolskikh 1994a), localized

at the Altai mountains from the beginning of the 3rd mill. BC. (Mallory 1992: 62, 225).

c) Samoyed **sejtᵌwə̑* (~ **sejkwə̑* ?) "7" (Janhunen 1977: 139; *tᵌ = c/k/s/t*) Nganasan *śaibə*, *śaibúa*, Enets *se'o*, cf. Yurak (= early Enets) *tet-siù* "mensis" (4 x 7), Nenets (Tundra) *śīβ* , cf. ordinal *si"ĭvmdej*, (Forest) *śe"eβ*; Selkup *seľči*; Kamassin *seigbu*, *sei'bш*, Koibal *sseigbe*, Mator *keipbe*, Taigi *kéibü*, Karagas *gydby*.

In spite of the incompatibility of inlaut consonantism, Honti (1993: 106), following the scholars like e.g. Castrén, Gombocz, Collinder, admits a relationship to Fenno-Permic **śejććem*.

Janhunen (1983: 119) modified the reconstruction into **sejptə̑*, assuming a borrowing from proto-Tocharian. This solution was accepted by Napolskikh (1995: 119–121). He saw its most probable source in early Tocharian B, presenting his own view on the phonetic development: B *ṣukt* < early B **ṣäwk(ʷ)tɜ* > proto-Samoyed **sewktwə̑* > **sejktwə̑* > **sejkwə̑* / **sejtwə̑*. Again, the hypothetical contact of the ancestors of the Tocharians and Samoyeds can be localized in space and time. The dominant Tocharian ethnicity of the creators of the Afanasievo culture, occupying the territory between the upper Yenisei and the Altai mountains in the 3rd mill. B.C. (beginning even *c* 3500 B.C.) is generally accepted (Mallory 1995: 379–382). The most detailed survey of the facts localizing the proto-Samoyed homeland (3rd-1st mill. B.C.) was made by Xelimskij (1988: 13–14). He specified it as a territory between the Ob and the Yenisei, in the tetragon Narym-Tomsk-Yeniseisk-Krasnoyarsk, inclusive of the North Altai and Sayany mountains. It means, that during the 3rd mill. B.C., the bearers of the Afanasievo culture (= the ancestors of Tocharians ?) and the ancestors of Samoyeds were probably neighbors. The Afanasievo culture was replaced by the Okunievo culture, in the beginning of the 2nd mill. B.C. probably representing the Samoyed ethnos (Vadeckaja 1990: 73). Let us mention that the oldest Europoid mummies from Xinjiang in Northwest China (early Tocharians ?) are dated *c* 2000 B.C. (Mallory 1995: 381–382).

B. Kartvelian languages

Kartvelian **švid-* "7" is reconstructed on the basis of (Old) Georgian *švid-i*, Megrelian *škwit-i*, Laz *šk(w)it-i*, Swan *i-šgwid*, *i-šgüd*, ord. *mē-šgwd-e* (Klimov 1964: 216–217; Fähnrich & Sardshweladse 1995: 429). It was already Bopp (see Klimov l.c.) who, reconstructing **šiwd-*, connected this numeral with Indo-European **septɱ*. Much more hopeful is the solution of Illič-Svityč (1964: 7; accepted by Gamkrelidze & Ivanov 1984: 875), who found the most probable source in Semitic, cf. Akkadian *sibittu* "7" (see below). It was accepted by Klimov (1967: 308). Later (1985: 206) he speculated about a modified disyllabic proto-form **šiwid-*.

Klimov (l.c.) collected more words of Semitic origin in Kartvelian including numerals (besides "7" also "8", "9", "10"/"100"; Manaster Ramer 1995: 16–17 adds "5"). The Kartvelian-Semitic contact can also be docu-

mented archaeologically. In the Maikop culture from northern Caucasus (26th-23rd cent. B.C.) Safronov (1989: 242–258) identified genetic links to the Upper Euphratian culture related to the Ebla civilization. Consequently he concluded that the authors of the Maikop culture were the Semites.

C. Afroasiatic languages

a) The numeral "7" is attested in the Semitic languages as follows: Akkadian *sebe*, *seba* // *sebet(tum)*, *sibittu* etc., besides Old Assyrian *šabe*; Ugaritic *šbʃ* // *šbʃt*, Phoenician *šbʃ* (= **šib(a?)ʃ-*) // *šbʃt*, Hebrew *šéḇaʃ* // *šiḇʃā*, Old Aramaic *šbʃ*, Jewish Aramaic *šəḇaʃ* // *šaḇʃɔ*, Arabic *sabʃ-* // *sabʃat-*, Sabean *šbʃ* // *šbʃt*, Geez *sabʃ*, *səbʃ* // *sabʃattū*, Jibbali *sōʃ* // *sɜbʃɜt*, Harsusi *hōba* // *hɜbayt*, Mehri *hōba* // *yɜbayt*, Soqotri *yhobɜʃ* // *hʸɜbʃah* etc. (Brugnatelli 1982; Dolgopolsky 1992: 34). The quoted forms formally represent m. and f. respectively, but in congruence they are used in the gender opposite to that of noun which follows in the gen. pl.; this inversion of gender also operates when the numeral appears without any accompanying noun (Moscati 1964: 116). Dolgopolsky, an author of these reconstructions (p.c., Oct 1995) mentioned that the feminine suffix is normally unaccented; he explains the function of the feminine-like marker **-át-*, determining the Semitic numerals 3 – 10 and accompanying the masculine nouns, as an original collective marker. The quoted forms reflect at least three protoforms: (i) **sibʃ-u(m)* // **sibʃ-at-u(m)* (Akkadian); (ii) **šíbʃ-u(m)* // **šibʃ-át-u(m)* "7" (Hebrew & Phoenician); (iii) **šabʃ-um* // **šabʃ-at-u(m)*. The *s*-form in Akkadian is probably old; only the old *s-* in the numeral "7" can explain the surprising *s-* in *samāne* "8" instead of the expected *š-* < **ṯ-*. It seems that the difference in the initial syllables **si- / *ši- / *ša-* could have been caused by the influence of the preceding numeral **šid[u]ṯ-* "6": in the sequence **ši...* "6" **sa...* "7" the second member was changed into *si..* in Akkadian, *ši...* in Hebrew & Phoenician and *ša...* in the other languages. Thus, the oldest proto-Semitic form should have been **sábʃ-u(m)* // **sabʃ-át-u(m)*. Such root vocalism agrees with the vocalisation of the Egyptian counterpart known from a Middle Babylonian transcription. The Semitic **s* reflects Afroasiatic **c-*.

b) Egyptian *sfḫw* // *sfḫt* "7", m. // f. resp., vocalized **safḫaw* // **safḫat* according to Middle Babylonian transcription *šap-ḫa* and Coptic (Ahminic) *saḫf* // *saḫfe*, (Sahidic) *sašf* // *sašfe* m. // f. (Vycichl 1983: 203). Egyptian *ḫ* instead of the expected *ʃ* probably originated as an alliteration to the following numeral *ḫmnw* // *ḫmnt* = **ḫamānaw* // **ḫamānat* "8". One would expect a spirantization **-bḫ- > *-fḫ-*, but the cluster *-bḫ-* exists e.g. in *ꜣbḫ* "to mix" or in *sbḫ.t* "a kind of amulet" (Vycichl 1983: 249, 185). It was perhaps caused by some combinatorical change; cf. the pair *ḫsf* vs. *ḫsb* "to succeed in protecting" (Edel 1955: 51). Vycichl (1983: 203) presented an alternative solution, assuming the following chain of substitutions: **-bʃ- > *-bγ- > *-fγ- > *-fḫ-*. Finally Schenkel (1990: 56) saw regular reflexes of Afroasiatic **p* in Egyptian *f* vs. Semitic **b*; Egyptian *ḫ* and Semitic **ʃ* should represent the continuants of Afroasiatic $*\gamma_1/*\gamma_2$.

c) Berber **sāh$_2$* (**hissāh$_2$* ?) // **-at* "7", m. // f. (Prasse 1969: 19, 89; Id. 1974: 403, 405) > Ghadames *sā // sāt*; Ghat *sa // sahət*, Ahaggar *əssa // əssahāt*, Ayr *əṣṣa // əṣṣayăt*, Awlimmiden *sah // sahat*; Zenaga *əššəh // əššdət*; Mzab *sā // sāt*, Semlal *sa // sāt* etc. and Guanche (Gran Canaria ?) *satti*, (Tenerife ?) *sa(t)*.

d) ? Chadic (Central): Gwendele, Hurzo *cíba* "7" (de Colombel; see Blažek 1990: 31) = Hurzo *cíɓà* (Rossing).

There are two possible etymologies which may not exclude one another:

(a) The primary semantic motivation could be based on "forefinger, index", cf. Arabic *sabābat*, *sibbat*, *sabbāḥat* id. Perhaps the same biradical nucleus *s-b* appears in Arabic *sabaʔa* "to take by hand". Outside Semitic the closest cognate is Somali *saʃab* "palm of hand with fingers" (**sabʃ-* like *gaʃan* "hand" < **ganʃ-*). Concerning semantics, cf. Zulu (Bantu) *isikhombisa* "7" and "forefinger" (Hoffmann 1952–53: 72) or Malay *tuďuh* "7" derived from Austronesian **tuZuq* "forefinger", orig. "to point" (Dahl 1981: 50).

(b) The Afroasiatic numeral "7" could be formed by the numeral "3". In Chadic there are two basic forms of the numeral "3": (i) **kanu* and **kan(u)di* in West & Central branches; (ii) **suḅa* ~ ?**saḅu* (or **c-* ?) in East branch: Mubi *súɓà*, Birgid *súúbù*, Jegu *ṣup // sub*, Migama *súbbà*, Dangla *sûbbà*, Sokoro *sùbbá*, Tumak *sûb*, Ndam *sûp*, Sumrai *súbù*, Lele *sùbù*, Kabalai *sàp*, Kera *soope*, Kwang *suupáy* (Jungraithmayr & Ibriszimow 1994: 327). And in some of these languages the numeral "7" is formed just on the basis of the numeral "3": Sumrai (Nachtigal) *dénā súbu* "7" = *"three [bent] fingers" (*dénum*, *dunum* "finger"), Ndam (Decorse) *wo subo* "7" = *woro* "4" + *supu* "3"; cf. also Tumak (Caprile) *ḍāg-sūùb* "7" : *sūùb* "3", Gulei (Lukas) *dag suba* "7" : *cuba* "7", Miltu (Bruel) *laksup* "7" : *sobo* "3". The glottalized **-ḅ-* (> Mubi *-ɓ-*) can reflect the cluster **-bʃ-* regularly. It would mean that the Semitic-Egyptian-Berber (-Chadic) isogloss **sabʃ-u* "7" and the East Chadic numeral **suḅa // *saḅu* "3" are fully compatible – phonetically as well as semantically. The more primitive meaning of the East Chadic numeral "3", and the transparent structure of its derivative representing the numeral "7", allow us to conclude: the numeral "7" attested in Semitic, Egyptian, Berber and maybe, Chadic, could be formed from the numeral "3". It implies the following two patterns based on the numeral "3": (i) subtractive, i.e. "7" = "[10 -] 3" (cf. Sumrai above); (ii) additive, i.e. "7" = "[4 +] 3" or "3 [+ 4]" (cf. Ndam above, and numerous other examples, e.g. in West Chadic: Gerka (Migeod) *praukum* "7" = *prau* "4" + *kun* "3" or Fyer (Jungraithmayr) *púrúwon* "7" = *píít* "4" + *yoón* "3").

A similarity of Indo-European **séptṃ* "7" and esp. of the Semitic form **šibʃátum* "7" (with mimation expressing definiteness) is apparent. It was already Møller (1909: 124) who connected these numerals (incl. the Egyptian counterpart), interpreting them as a common heritage. The same approach has been applied in the works of Bomhard until recently (1994 & 1996: #188). A more realistic solution seems to be a borrowing of the Semitic numeral into Indo-European:

**sab'atum* > **sábʃatum* (after **sábʃum*) > **sábʃətum* >> **séptṃ*

(Illič-Svityč 1964: 7; Gamkrelidze & Ivanov 1984: 875; Dolgopolsky 1988: 16).

Supported by other Indo-European words borrowed from Semitic, it represents a strong argument for an early contact between these families. The most natural explanation seems to be a neighborhood of the Semitic and Indo-European families, implying a Near Eastern localization of the Indo-European homeland. Concerning the chronology, this borrowing should have preceded the disintegration of the Indo-European family, usually dated before 4000 B.C. (e.g. Mallory 1992: 127, 276 presented an estimation that the disintegration began about 4500 B.C.).

D. Etruscan

Etruscan *semφ-(-ś)* "7" and *semφalχ- (-ls)* "70" (d'Aversa 1994: 47, 64) resemble both the Indo-European and the Semitic numerals "7". A borrowing is probable.

E. Basque

Basque *zazpi /saspi/* "7" resembles very suggestively Coptic (Sahidic) *sašf, sašfe*, (Bohairic) *šašf, *šašfi* m., f. "7" (Gabelentz 1894: 98–99; Löpelmann 1968: 1075). There are more lexical parallels between Basque and Coptic or late Egyptian, collected esp. by Gabelentz (cf. Basque *sei* "6" vs. Coptic *sow* m., *soe* f. "6" ?). Any direct contact between Basque and Coptic // late Egyptian seems to be improbable. But the fact that in southern Spain some Egyptian hieroglyphic signs were discovered (Anderson 1988: 31), can support a certain kind of contact, perhaps mediated by the Phoenicians.

§4. Conclusion

The analyzed data can be summarized as follows:

1) There is Arabic *sabābat, sibbat, sabbāḥat* "forefinger, index" and the Afroasiatic root *ʕV "hand" (Egyptian ʕ "hand, arm" and Semitic preposition "with": Arabic *maʕa*, Hebrew *ʕim*, formally corresponding to Egyptian *mdj* "with, by", lit. "in hand"). A hypothetical compound **sab.. + ʕV could have been preserved in Somali *saʕab* "palm of hand with fingers", derivable from *sabʕ-.

2) East Chadic *suḍa ~ *saḍu* "3" may reflect Afro-Asiatic *s/cabʕ-u*, originally perhaps a finger-name related to the Semitic/Arabic "forefinger".

3) Semitic-Egyptian-Berber(-Chadic) isogloss *cabʕ-u(m)* "7" may represent 1) the compound "hand" + "forefinger" or b) a formation based on "3", perhaps a subtraction "7" = "[10 -] 3" ?

4) Semitic *sabʕátum* "Siebenheit" was borrowed into Indo-European in the form *séptm̥* "7".

5) The unintelligible borrowing (its ordinal form *septm̥[ ]o-*) was reinterpreted as a superlative "the most honorable".

6) Kartvelian *š[i]wid-* "7" was borrowed from a Semitic source close to Akkadian *sibittu* (Eblaic ?).

7) Fenno-Permic **se(j)ććem* > **śejććem* "7" was borrowed from a Baltic source close to Lithuanian *sẽkmas* "7th ".

8) Ugric **θăpt(ɜ)* and/or Mansi **sā̆t(ɜ)* "7" were borrowed from Indo-Iranian **sapta* or from proto-Tocharian **śəpət.*

9) Samoyed **sejptə̑* "7" was borrowed from proto-Tocharian **śəpət;* the alternative reconstruction **sejkwə̑ // *sejtwə̑* indicates a source in some form preceding Tocharian B *ṣukt.*

10) Etruscan *semφ-* "7" could have been borrowed from some Indo-European (Anatolian ?, Italic ?) or Semitic source.

11) Basque *zazpi* "7" was probably borrowed from a late Egyptian source close to Coptic (Sahidic) *sašfe*, (Bohairic) **šašfi* f. "7".

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INDO-EUROPEAN "eight"

For Professor Johann Knobloch to his 80th birthday on January 5, 1999)

§1. The numeral "8" is attested in all branches of the Indo-European language family. The most important forms of this numeral and their basic derivatives can be projected into the following partial reconstructions allowing their deeper analysis. For the first approximation the 'Brugmannian' reconstructions are used.

Indo-Iranian:

**okt(u)* "8" > Old Indic nom.-acc. *aṣṭā́ & aṣṭáu*, Pali *aṭṭha*, Hindi etc. *āṭh*; Dameli *aṣṭ* , Khowar *oṣṭ* etc.; Avestan *ašta*, Buddhistic Sogdian *'št*, Yaghnobi *ašt*, Khotanese *haṣṭa*, Tumshuq Saka *haṣṭi*, Afghan *atə*, Ossetic Digor *ast*, Shugni *waṣt*, Yidgha *ašč*o, Ormuri *āṣt*, Parachi *ōšt*, Zoroastrian Pahlavi and Modern Persian *hašt* etc. (with *h-* after Iranian **ha pta-* "7").

**oktomó-* "8th" > Old Indic *aṣṭamá-*; Avestan *aštəma*, Sogdian *'stm*, *'štmyk*, Ossetic Iron *æstæm*, Khotanese *haṣṭama-*, Modern Persian *haštom* etc. with *-m-* after Indo-Iranian **saptama-* "7th" and **navama* – "9th" instead of expected ***aćtāva-* (Emmerick 1992b: 182).

**oktōti-* > Iranian **aštāti-* "80" > Avestan *aštāiti-*, Christian Sogdian *št'ɣ*, Khotanese *haštātā*, Yazgulam *aštod*, Afghan *atiā*, Ossetic Iron *æstaj*, Zoroastrian Pahlavi *haštāt* etc. In this Iranian form a recent secondary innovation is seen in confrontation with its Indo-Aryan counterpart (Emmerick 1992a:174 assumed an influence of the numeral "60", in Avestan *xšuuašti-*, reinterpreted in *xšuuaš* "6" + *-ti-*).

Old Indic *aśītí-* "80", perhaps more archaic, represents a serious problem. There are more attempts to explain it, but none of them is sufficiently convincing.

Sommer (1951: 83) and Mayrhofer (1956: 59) assume the dissimilation from **oktr̥ti-* > **aśtití-* > *aśītí-*. But **oktr̥ti-* would give Indo-Aryan ***aśthití-*, cf. Old Indic *sthíti-* "Standort" (but Avestan *stāti-* "Stand") and Greek *στάσις* "Standort" < **stə₂ti-*. The final shape of the numeral would be **aṣṭhití-*. The cluster *-ṣṭh-* is known, there is no dissimilative loss even when the syllable *-ti-* follows, cf. *ní-ṣṭhita-* "being in or on, fallen from the hand, grow forth, complete, perfect, firm, fixed" etc. (Monier-Wiliams 1899: 563). It means that the expected change **aṣṭhití-* > > **aśītí-* cannot be a result of any similar dissimilation.

Hamp (1982: 37–38) proposed the following development: **okt̥ə₃tí-* > **ogdə₃tí-* > **aźditĺ-* > **aźitĺ-* > Old Indic *aśītí-*. The postulated voicing of the originally unvoiced velar stop had to be caused by the neighboring voiced laryngeal, similarly as in Greek *ὄγδοος* "8th" (Winter 1980: 489) and probably in Anatolian (Lycian) too (Hajnal 1995: 140).

In Old Indic *aśītí-*, Brugmann (1892: 480) identified an original dual **okī-* similarly as in **okʷī* "2 eyes". In that case the difference between Indo-Aryan and Iranian forms looks like the difference between dual of *i-* and *o*-stems respectively (cf. Beekes 1995: 194).

Analyzing older etymologies including Brugmann's assumption (fn.101), Szemerényi (1960: 60–62) presented his own scenario. He derived *aśītí-* via haplology from **aśī-śati-*, similarly as *ṣaṣṭí-* "60" from **šaś-śati*. The vowel *-ī-* is explained by the influence of "30" and "40", which are reconstructed as **trīśant- & *catvārīśant-* > *triṁśat & catvāriṁśat* resp. The primary Indo-Aryan form was **aśtī-śant-* according to Szemerényi. He also assumed a loss of *-t-* via dissimilation, referring to the dissimilative loss of dental in some Germanic forms: **septm̥tos* > Germanic **seƀunðaz* "7th" or Low German *tachentig* "80" < **tachtentig*.

Nobody from among the scholars quoted above, mentioned the facts of modern Indo-Aryan languages. Hindi, Lahnda, Panjabi *assī*, Bengali *āsi*, Sindhi *asī* etc. reflect **aśśīti-*, while Gujarathi *ɛsī* and Marathi *ẽśī* represent an original form with epenthesis **aiśīti-* (Berger 1986: 49). These archetypes probably indicate a compound **aśti-śati-* with the Caland-form **aśti-* (to nil-grade **aśtu-* ?; cf. Szemerényi 1960: 60). It is quite natural to expect a simplification of two *ś(-)t*'s, perhaps in **aśiśati-* and further **aśśiati-* > **aś(ś)īti-*. On the other hand, Hamp's solution is perhaps compatible with the original geminate, viz. **aźditi-* > **aźźiti* > **aśśiti* > *aśītí-* or sim., too.

(Abaev 1: 77, 190–91; Bailey 1979: 472–73; Berger 1986: 29; Debrunner & Wackernagel 1930: 357–59, 370, 408; Mayrhofer 1986: 137, 142–43)

Anatolian:

okt*[ ]*ōntā* > **ogd*[ ]*ōntā* > Lycian *aitãta* "8" (or "80" ?) (Melchert 1993: 3; Id. 1994: 313 speculated about a specially conditioned change **-kt-* > **-yt-*, but *y/i* can be a regular reflex of IE **ĝ* (*ʰ*) – cf. Melchert 1994: 303). Hajnal (1995: 139–40, 159, 160) supported the following development: **oktṓ-ntā* > pre-Anatolian **ogdṓ-ntā* > common Luwian **aytāntā* > early Lycian **eiténta* > (after *a*-Umlaut) Lycian *aitãta* "8". The suffix **-ntā*, forming also other numerals, determines individualized plurals with a collective function (Hajnal 1995: 140). Hittite cardinal **8-*ta-aš* also represents rather the *-nt-* stem and not a direct reflex of IE **oktṓ* (Eichner 1992: 85). Kimball (1987: 185–92) and Melchert (1994: 72, 305) assume that Lycian probably differentiated initial **H₂* and **H₃*, giving *χ/q* vs. ∅ respectively. But they quote only Lycian *eperije-* "sell" vs. Hittite *happariye-* id. to support this suggestion. The zero reflex of **H₃-* in Lycian does not agree with the almost generally ac-

cepted reconstruction *H_3ewi- "sheep" (Beekes 1988: 81), continuing in Lycian *χawa-* id. (Melchert 1994: 286, 297, 307, 328 reconstructs pre-Anatolian **Hów-*). The most rational solution seems to assume that all laryngeals followed by **o* were probably lost in the Anatolian languages (Beekes 1988: 80).

o[k̑t]ŏwonti/o* – > Hieroglyphic Luwian **8-*wa^{n}zi/a* (Eichner 1992: 85; Meriggi 1962: 165 has read **8**-*wa-a-ī* "acht(fach)", but Hawkins, Morpurgo Davies & Neumann 1974: 192 have proved that the real phonetic value of the sign previously read "*ī*", is "*za*").

Armenian:

**ok̑tṓ* > **optṓ* (according to **septm̥* "7" as Elean *ὀπτώ*) > **owt'* > Armenian *ut'* "8" (Brugmann 1892: 480, following Bugge; Solta 1960: 111–12 with older literature; Kortlandt 1980: 103; Winter 1992c: 350). Kortlandt (1994: 255) says that "...the absence of initial aspiration shows that it adopted the zero grade vocalism of the ordinal." This rather artificial explanation is motivated by an aprioristic assumption that 'Brugmannian' **ok̑tō(u)* reflects 'laryngealistic' **$H_3ek̑teH_3$*. But Beekes and Kortlandt are silent concerning an alternative possibility that **o-* is derivable from any laryngeal followed by **-o-* (Beekes 1988: 76).

Phrygian:

**ok̑tōwo-* > **ottuwo-* > Old Phrygian dat.sg. *otuwoi wetei* "in the 8th year" (Meister 1911 – cf. Pokorny 1959: 775; Neroznak 1978: 83 with older literature; Woudhuizen 1993: 13 prefers the internal reconstruction **ok̑tuwo-*). Phonetically, this interpretation remains rather ambiguous, cf. Old Phrygian *wanaktei* "ἄνακτι", where the cluster *-kt-* (< **-gt-*) is preserved (Ködderitzsch 1985: 23).

? Macedonian:

**ok̑tō-* > **otto-* > Macedonian place name (acc.) *Otto-lobum* (Liv. XXXI 36, 6), interpreted already by Pape-Bensler as 'Οκτώ-λοφος (Blumenthal 1930: 19; Ködderitzsch 1985: 31).

Greek:

**ok̑tṓ* > Greek Homeric, Ionic-Attic *ὀκτώ* "8", Boeotian *ὀκτό*, Lesbian *ὄκτο* (after *δύο*), Elean ὀπτώ, Heraclean *ηοκτώ* (after *ἑπτά* "7") (Schwyzer 1939: 590; Chantraine 1968: 790–91; Waanders 1992: 373).

**ok̑tŏwo-* > **ogdŏwo-* > Greek Homeric *ὄγδοος* "8th", cf. Ionic *ὄγδῶι* and especially Old Corinthian *[ὀγ]δόϝα* (Schwyzer 1939: 595). There are various attempts to explain the unexpectedly voiced cluster *-γδ-*: Schwyzer l.c. saw in it an influence of the preceding ordinal *ἕβδομος* (cf. also Waanders 1992: 380). Sommer (1951: 25) speculated about regressive assimilation, starting from **ok̑twos*, where **-w-* caused the voicing of the complex **-k̑tw-* in

ὄγδϝος > ὄγδο(ϝ)ος*, similarly as in **septmos > *ἕβδμος > ἕβδομος* "7". On the other hand, he rejected as unfounded the protoform **o̯ktmos > *ὄγδμος > *ὄγδϝος*, reconstructed by Endzelin (*KZ* 65[1939]: 137). Winter (1980: 489) assumes a presence of *o*-coloring voiced laryngeal, causing the voicing of the cluster **-k̑t-* via regressive assimilation, hence **o̯k̑tōwos = *Oe̯k̑teO[w]os > *Ok̑toO[w]os > *ogdo(w)os* (O = *H₃*). An alternative solution based on the voicing character of **H₃* could be as follows. If we accept the zero-grade pattern of ordinals (Beekes 1995: 214, 216), the numeral "eighth" can be reconstructed as **H₃k̑t(o)wo-*. If the symbol **H₃* reflects the **voiced** fricative pharyngeal *ʕʷ* (Beekes 1994: 450 and 1995:126), it is quite natural to expect **progressive assimilation**, i.e. **ʕʷk̑two- > *ʕʷgdwo- > *ogdo(w)o-* . Let us add that in languages where the laryngeals & pharyngeals are familiar (e.g. Semitic), the rules of incompatibility exclude a presence of two *ʕ*'s in one stem.

Attic *ὀγδοήκοντα*, Heraclean *ηογδοήκοντα* "80" are formed after *πεντήκοντα* "50" on the basis of the ordinal stem (cf. *ἑβδομήκοντα* "70").

Albanian:

**o̯któ́ + -ti- > *a(k̑)tó́ + -tā* > Albanian *tetë* "8" (Hamp 1992: 915–16 assumed that the suffix **-ti-*, originally forming numeral abstracts, was replaced by feminine suffix **-tā*). Georgiev (1977: 205) connected the loss of initial **a-*, **o-* with the Dacian ingredient in Albanian. The same feature typical for Rumanian has a natural explanation in the Dacian substratum in this language. Mann (1977: v) quoted some proper names from the western part of the Balcan peninsula such as *Tattu*, *Tato*, *Tatus*, seeing in them possible Illyrian (?) reflexes of the numeral "8".

Italic:

**o̯któ́* > Latin *octō* "8". In compounds also *octi- & octu-*.

**o̯któwo-* > Italic **oktāuo-* > Latin *octāuus* "8th", Oscan *Úhtavis* 'Octavius'. The unexpected *ā* instead of **ō* appears in the same sequence, e.g. in *flāuus*, *grāuus*, *prāuus* (cf. Coleman 1992: 412, 439 with other explanations).

**o̯któdk̑n̥tā* > **o̯któdĝn̥tā* > Latin *octōgintā* "80".

? Lusitanian:

**o̯któwo-* "8th" > Lusitanian (or Hispano-Celtic ?) personal name *Otaui* (Schmoll 1959: 48).

Celtic:

**o̯któ́ >> *oktɪn̥* (after **septɪn̥* > Old Irish *secht*^{N} "7") > Old Irish *ocht*^{N} "8". Cf. also *ochtmoga*, gen. *ochtmugat* "80" < **oχtamu-kont-* (Thurneysen '1946: 245, 247; Greene 1992: 510–11).

**o̯któ̄* > Old Breton *eith*, Middle Welsh *wyth* "8" (Brugmann 1892: 480 derived the final vowel **-ī* from **-ū* < **-ō*). Old Breton *eithnec* "18" < Brythonic **oxtūndekan* preserves the final nasal (Greene 1992: 540).

**okt̄o-* or **okt̄u-* + **-m-* (after Celtic **sextumeto-* "7th") + **-eto-* > Gaulish (La Graufesenque) *oxtumeto*[ ], Welsh *wythfed*, Old Irish *ochtmad* "8th" (Lewis & Pedersen 1937[54]: §335; Thurneysen 1946: 250). There is perhaps an older ordinal form *OCIOMV* "from the eighth" (the Coligny calendar), if it reflects **octiomo-* and further **okto-omo-* like **deciomo-* "10th" (Olmsted 1988: 293–95).

**okt̄o-(d)kn̥t..* > Celtic **oktōkant..* > Gaulish (the Coligny calendar) *ox*[..]*antia* "80" (Olmsted 1988: 296).

Germanic:

**okt̄ou* > Germanic **axtau* > Gothic *ahtau*, Crimean Gothic *athe*; Old Icelandic *átta*; Old Saxon *ahto*, *ahta*, Old High German *ahto*, besides inflected **ahtouui* (emended from *hatouui*), dat. *ahtowen* etc. (Ross & Berns 1992: 588–589).

**okt̄́o-* > Germanic **axtṓpan-* > Old High German *ahtodo* (or *ahtôdo*) "8th";

**okt̄ōtó-* > Germanic **axtōðan-* > Gothic dat.sg. *ahtudin* (with *u* written for *o*) "8th"; common Scandinavian **attuðe* > Old Icelandic *átte* id., besides Icelandic *áttundi*, Middle Low German *achtende*, Old Frisian *achtunda* etc. "8th" with *-n-* after **seβunþan-* / **seβunðan-* "7th" (Ross & Berns 1992: 629–30).

okt̄o-dḗ kn̥t-* > Gothic *ahtautehund* (Ross & Berns 1992: 609); Lühr, *MSS* 59 [1979]: 65 derived *-tehund* from **tē*/tō χunðaⁿ* and interpreted it as "eight [decads] to hundred".

**okt̄o-dekm̥̄* > Old Saxon *ahtedeg*, High German *ahtozug* (besides *ahtoda* and *ahtozo* resp.); Old Icelandic *átta tiger* besides *áttatiu* etc. (Ross & Berns 1992: 602–09, 618 with discussion of other forms).

Balto-Slavic:

**okt̄o* > (East) Baltic **aštō* + *-nī* (after **septin-ī* "7" and **devin-ī* "9" – cf. Smoczyński 1989: 79) > Lithuanian *aštuonì*, Latvian *astuôņi* "8".

**okt̄mo-* > Balto-Slavic **aś(t)ma-* > Old Lithuanian *ãšmas* "8th", cf. Latvian dial. *asmīte* "the eighth part of acre", Prussian nom. *asmus* = */asms/* < **asmas*, cf. acc. *asman*; Old Church Slavonic *osmъ* "8th" and the secondary cardinal *osmь*. It is quite legitimate to assume a primary archetype **okt(o)wo-*, similarly as in the case of the Indo-Iranian ordinal. The irregular change **-w-* > **-m-* can be explained by 'pressure' of the preceding numeral **septm̥* "7" (Szemerényi 1960: 110–11; Smoczyński 1989: 90).

**okt̄onto-* > East Baltic **aštōntas* > Lithuanian *aštuontas & aštuñtas*, Latvian *astuôtaîs* can be explained as innovations formed according to "7th" and "9th" (Lithuanian *septiñtas* and *deviñtas* resp.), cf. also the parallel forms in Germanic, e.g. Old Frisian *achtunda* (Trautmann 1923: 15; Smoczyński 1989: 91–95).

?? **okt-* > Yatwingian *aktif* "8" (Zinkevičius 1984: 8–9 thought about a borrowing from German, not excluding a mistaken record instead of the expected **aʃtif*, or even a 'centum' dialectism of the type *kuo* vs. Lithuanian *šuõ*

"dog"). The termination *-if* can be also explained per analogiam to *geptif* "7" (= */septins/* ?).

Tocharian:

**okt̄o(u)* > Common Tocharian **æktu* > **oktu* (*u*-umlaut) > A *okät*, B *ok(t)* "8" (cf. Hilmarsson 1986: 213). The internal reconstruction of Čop (1975: 71) **okt̄om* with *-m* after **septṇ* "7" and **neuṇ* "9" is in principle possible (cf. Goidelic), but unsubstantiated. In B *okt* instead of expected **ekt* Van Windekens (1976: 331) assumed an influence of the A language.

**okt̄o(u)-N-to-* > A *oktänt*, B *oktante & oktunte* "8th" (Winter 1992b: 138). The nasal appears perhaps under the influence of the neighboring numerals A *śäptänt* "7th", B *ñunte* "9th" (Van Windekens 1976: 331).

**okt̄o(u)-(d)ḱṇtH*$_2$ (Winter) or **-(d)ḱonts* > **-kōs* (Klingenschmitt 1994: 329) > A *oktuk* "80", while the inserted nasal in B *oktaṅka*, *oktaṃka*, *oktamka* id. appears under the influence of the neighboring numerals: B *ṣuktaṅka* "70" and *ñuṅka*, *ñumka* "90" (Winter 1992b: 121).

§2. Reconstruction and etymology

There are various possibilities of reconstruction, implying different etymological solutions:

a) **H*$_2$*oḱtoH* (Mayrhofer 1986: 142)

b) **H*$_3$*eḱtoH*$_1$ (Waanders 1992: 373)

c) **H*$_3$*eḱteH*$_2$ vs. ord. **H*$_3$*eḱtH*$_2$*wo-* (Beekes 1995: 214; cf. Winter 1980: 489)

d) **(H*$_2$*)oḱtéH*$_2$*(u)*, vs. ord. **(H*$_2$*)oḱtH*$_2$*u*$_2$*o-* (Rix 1976: 172, in contrast to dual ending **-oH*$_1$ – see Cowgill 1985: 26)

e) **okdō(w)* (Mann 1984–87: 871).

Most scholars identify the termination of the numeral "8" as the ending of dual of *o*-stems (Brugmann 1892: 480; Pedersen, *KZ* 32[1891–93]: 271–72). It implies the existence of an independent word **okto-* meaning "4" or an object for which quaternity is characteristic (cf. Hirt, *IF* 17[1904]: 78). This conclusion is supported by both external and internal arguments:

Common Kartvelian **otxo-* "4" (Georgian *otx-i*, dial. *otxo*, Laz *o(n)txo*, *otxu*, Mingrel *otx-i*, Svan *woštxw*) can represent a borrowing from some Indo-European source of a 'centum' type (Klimov 1977: 162–63; 1985: 206–207). On the other hand, the alternative reconstruction **os*$_1$*txw/o-* resembles a source of a 'satəm' type (Manaster-Ramer 1995: 16–17). The opposite direction of borrowing proposed by Pisani (1980: 47) is improbable for phonological and chronological reasons. Olzscha (*IF* 73 [1968]: 150) found support of an existence of **okto-* "4" in Etruscan *huθ*, traditionally interpreted as "6" (Torp). Olscha, following Oštir (1921: 34), preferred the meaning "4", relying on the gloss of Stephanus Byzantius Αὔτη (= ἡ Ἀττικὴ Τετράπολις) πρότερον ἐκαλεῖτο Ὑττηνία.

The most convincing internal evidence is seen in the Avestan unit of length *ašti-*, corresponding to Greek *παλαιστή* "four fingers' breadth, palm" (Henning 1942: 235; 1948: 69). Bartholomae (1904: 262) translated *ašti.masah-* "von der Grösse einer *a.*" [Vīdēvdāt 13.30] = Zoroastrian Pahlavi *aštak masāk*; cf. also Avestan *uz-ašti-* "super-*ašti-*" = *čigōn 8 angust* "von 8 Fingerbreiten" [Frahang i oīm 27; see Bartholomae 1904: 410]. Henning (1942: 235) has found a counterpart in Greek *διχάς*. Later Henning (1948: 69) admitted that the difference between an *o*-stem in expected **okto-* > Iranian **ašta-* and the really attested *i*-stem in Avestan *ašti-* remains unsolved; *ašti-* can be derived from both **ok̂-ti-* and **ok̂-sti-*. The same suffixal extension also forms other length units in Indo-Iranian, cf. Old Indic *diṣṭi-* id., Avestan *dišti-* "short span (thumb and forefinger)", Ossetic *dīsny / iʒestæ* or Old Indic *vítasti-*, Avestan *vītasti-*, Afghan *wlešt*, *lwešt*, Ossetic *wydīsn(y) / uʒestæ*, Persian *bidast*, Baluchi *gidist* etc. "span (thumb and little finger)" – see Abaev 1: 364 and 4: 113 resp.

Another and more serious objection was presented by Bailey (*Asia Major* 7[1959]: 23; Id. 1979: 473; cf. recently Schmid 1989: 14–15 and Emmerick 1992a: 174–75), connecting Avestan *ašti-* with formally corresponding Old Indic *áṣṭi-* "reaching", an evident derivative of *naś-* "to reach" < **H₂nek̂-* : **H₂enk̂-* : **H₂n̥k̂-* (Mayrhofer 1992: 27–28; the etymology of the numeral "8" based on this verb was proposed already by Benfey and Pott in the 19th cent. – see Debrunner & Wackernagel 1930: 357 and Emmerick 1992a: 174–75).

It is evident that the numeral "8" and the root **H₂enk̂-* are not related. On the other hand, the etymology of Avestan *ašti-* "breadth of four fingers" can represent a 'bridge' between the numeral "8" and the root **ok̂-* "pointed, sharp", playing an important role in some previous etymologies, beginning with Fick (1891) and Prellwitz (1892), cf. Walde & Hoffmann II: 200. Later Muller (1927: 137–38) postulated a hypothetical singular **oketom* "Spitzenreihe" = "Spitzen der vier Finger". He saw in it the same suffix as in **[de]kṃ-tom* "Zehnreihe" = "100". Perhaps a better solution could be found in the collective in **-eto-*, attested in Lithuanian *dvējetas* "group of two" (Old Lithuanian *dvetas*), similarly *abējetas*, *trējetas*, *kẽtvertas*, *peñketas* concerning 'both, three, four, five' resp.; cf. also *kẽletas* "quelques-uns" vs. *kelì* "quelqu'un". Vaillant (1958: 670–71) found parallel suffixes in Latvian dial. *divatā* "by twos" and Slavic, e.g. Czech *jednota* "unity" (**-otā*). Vaillant saw them as variant formations of the type Old Indic *daśátam* "decade". The same suffix also forms ordinals, e.g. **penkʷeto-* "5th" > Old Indic *pañcathá-*, Albanian *ipesëte*, Gaulish *pinpetos*, Old Irish *cóiced* (Pokorny 1959: 808). Muller l.c. and Kretschmer (*Glotta* 19[1931]: 211) found a relative also in **oketā* "harrow", which can be interpreted as a plural, i.e. "Spitzenreihen". This word is attested only in western Indo-European languages, cf. Latin *occa* (**otikā* < **otekā* < **oketā* ?); Old Welsh *ocet*; Germanic **agiðō* > Old High German *egida* etc., besides the 'centum' forms in Baltic: Old Prussian nom.pl. *aketes*, Lithuanian *akėčios* and Ossetic *adæg* id. (Toporov 1975: 67–68 with older

literature). Boryś (1984: 57–63) found a Slavic counterpart in **osetь* (**oḱeti-*) > Russian dial. *oset'* "barn, threshing floor", Ukrainian (Polesje) *oset'* "a place where sheaves are dried", Byelorussian *asec'* "a kind of drying room with kiln and platform formed by poles" and Polish *jesieć* "riddle". An original meaning "a construction consisting of poles or rods" is in principle compatible with "harrow", i.e. originally "a construction consisting of pointed branches" (cf. Schrader & Nehring 1917–23: 213). The preceding etymological attempts lack a demonstration of an evident semantic connection between the meanings "fingers" on the one hand and "pointed" on the other hand. This 'missing link' in semantics can be found e.g. in the Greek denotations of 'fingers' and 'toes' *ἄκραι χεῖρες* and *ἄκροι πόδες* (Herodot I, 119), i.e. "points of hands and feet" resp. (see Schrader & Nehring 1917–23: 638); cf. also Old Breton *acer-uission* "mit spitzen Fingern" (Pokorny 1959: 20).

The acceptance of the derivation of **oḱtō(u)* "8" from **oḱ-* "pointed, sharp" opens a possibility to reconstruct correctly an archetype of the numeral. The root **oḱ-* is reconstructed on the basis of Greek *ὄκρις* "jagged point, prominence", *ὀκριόεις* "pointed", Latin *ocris* "mountain peak", Marrucian *ocres* "montis", Umbrian *ukar*, gen. *ocrer* "arx, mons", Middle Irish *och(a)ir* "edge", Old Breton *ocerou* pl. "sharp, spiky" (Pokorny 1959: 20–21), cf. also Hispano-Celtic (Peñalba de Villastar) *OGRIS* = *ocris* "point" (Meid 1996: 17). There are evident relatives with an *a*-vocalization: Greek *ἄκρις* "hill-top, mountain", *ἄκρος* "pointed", Latin *ācer* "sharp", Oscan *akrid* "acriter", Gaulish *Axro-talus* "with high forehead", Old Irish *ér* "high" (**akro-*) while in other languages there is no distinction between **o-* and **a-*, e.g. in Old Indic *áśri-* "corner, angle, edge", Lithuanian *aš(t)rùs*, Old Church Slavonic *ostrъ* "sharp". Other extensions are also known, e.g. in *-n-*: Old Indic *aśáni-* "point of arrow", Avestan *asəŋga-* "stone", Greek *ἄκαινα* "point, spine; measure of length (!)" etc.;

in *-t-*: Old Indic *apāṣṭhá-* "the barb of an arrow" (RV X, 85.34) < **apa-aśthá-* besides *apaṣṭha-* "the end or point of the hook for driving an elephant (Pāṇ. VIII, 3.97), Avestan *aštaii-* "arrow" (Bartholomae 1904: 261), Greek *ἀκτή* "cap, promontory, elevation" etc.;

in *-o-/-ā* : Greek *ἀκή* "point", Tokharian A *āk*, B *āke* "end, edge, point, peak" < **aḱ-os* etc.;

in *-i-/-y-*: Greek *ἀκίς*, *-ίδος* "point, thorn, spine", Old Saxon *eggja* "point, edge" etc. (Pokorny 1959: 18–22).

The **a-/*o-* ablaut is compatible with the standard apophonical pattern *e* / *o* owing to the laryngealistic reinterpretation in **H_2e-/*H_2o-*. Hence **aḱ- /*oḱ-* = **H_2eḱ- /*H_2oḱ-* "pointed, sharp" (Beekes 1972: 130; 1995: 138).

The preceding data allow us to reconstruct **H_2oḱtoH_1(u)* "8" (**-oH_1(u)* after Eichner 1992: 48, 85; the reconstruction was presented by Klingenschmitt 1994: 387, fn. 130). A striking parallel to the internal structure "8" = 'dual of "4"' appears in the Ugric languages where the numeral **ńɤlɜγ* "8" (Ob-Ugric **ńīləγ*, Hungarian *nyolc* with *-c* after *kilenc* "9") probably repre-

sents the numeral "4" (Ob-Ugric **ńĭ lɜ*, Hungarian *négy* < Fenno-Ugric **neljä* or **ńeljä*) plus the dual suffix **-γ* < Fenno-Ugric **-ka* (Gulya 1976: 314; the Ob-Ugric reconstructions follow Honti 1982: 171).

There are also other etymological solutions:

Erhart (1970: 95–96) proposed a geometric succession 2, 2^2, 2^3 , formed by a dual element **H^{w}o* and **k^{w}et-* (or **ket-* !) "pair" (besides Russian *četa* "pair" there is also Ossetic *cæd(æ)* "pair of oxen" – see Abaev 1958: 293):

**k^{w}etwor* "4" < **k^{w}et(e)-* "pair" & **H^{w}o-* & *-r*

**o̯ktō(u)* "8" < **H^{w}o̯ktoH^w* < (dissimilated from) < **H^{w}o-k^w(e)t-oH^w* .

This model looks rather artificially but a similar system is used e.g. in Burušaski (the examples are from the dialect Werčikwar of Yasin): *altán* "2" : *wáltu* "4" : *altámbu* "8" (it was already Hamp 1969: 340 who mentioned the resemblance of the Burušaski binary pattern with that of Indo-European). On the other hand, there are phonological and morphological reasons against this tempting hypothesis: (i) It is generally accepted that the bearer of the dual meaning is the *e*-coloring laryngeal **H$_1$* (Beekes 1995: 194–95). (ii) The dual was used only suffixally, never prefixally. (iii) The supposed dissimilatory change **-k^{w}t-* > **-o̯t-* has no analogy within Indo-European.

Mann (1984–87: 871) presented an original, although rather problematic solution, identifying the numeral **dwō(u)* "2" in **o̯ktō(u)* "8" < **o̯kd(w)ō(u)*. Unfortunately, explaining **o̯k-*, he was too laconic, writing only "..cf. **e̯k-* (**o̯k-*)". The root **e̯k-* probably means **e̯ks*, **e̯k(s)to-* "out (of)", attested in Armenian *əst* "out, beyond", Greek *ἐξ*, *ἐκ* "out", *ἐκτός* "outside", Albanian *jashtë* id., Latin *ex*, Gaulish *ex-* "out", Old Irish *acht* "except" (Mann 1984–87: 236–37; usually reconstructed **H$_1$eĝ^h(s)*, cf. Pokorny 292–93; Beekes 1995: 221). The only possibility seems to be a hypothetic existence of an adverb in *o*-grade (cf. Greek *ἔπι* "on" vs. *ὄπιθε* "in the rear"), perhaps **o̯k tos* "outside". The compound **o̯kto-dwō(w)* "outside two" = "eight" is semantically quite transparent . At the same time it allows to explain the distinction **o̯któ́(w)* "8" vs. **oĝdōwó-* "8th", probably via a haplology **o̯któ́d(w)ō(w)* > **o̯któtō* (*w)* > **o̯któ́(w)* vs. **o̯ktod(w)ōw-ó-* > **o̯kdōwó-* > **oĝdŏwó-*. The ablaut **e-* / **o-* would indicate an initial **H$_1$-*.

Fay (1910: 422) proposed a close reconstruction **o̯k-dw-oyos*, interpreting it as "tip-2-goes".

The internal structure of the numeral "8" (and "9") based on a subtractive pattern is recognizable in more languages, e.g. Ainu *tu-pes* "8", *sine-pes* "9" vs. *tu-p* "2", *sine-p* "1" resp. (Hamp 1969: 337–39), Mikir (⊂ Sino-Tibetan) *ner-kep* "8" = "two from ten", cf. *ser-kep* "9" vs. *kep* "10" (Hodson 1913: 327) and others. The same structure is analyzable in the Fenno-Volgaic and Permian languages. Traditionally the numerals are analyzed as follows: Fenno-Volgaic **kakteksan* "8" and **ükteksä* "9" consist of **kakta* "2" and **ükte* "1" resp., plus **-e-k-sä(-n)* = 'negation-verb' **e-* + 'modal-reflexive conjugation suffix' **-k-* + '3rd pers. sg. marker' **-sV-* + 'dual suffix' **-n* (only for "8") –

see UEW 643. On the other hand, Honti 1993: 156–59 reconstructed Permian **kɨkja-mɨn(ɜ)ś* "8" and **ȯk-mɨnɜś* "9", where **kɨk* and **ȯk* mean "2" and "1" resp. For **-mɨnɜś* Honti assumed the meaning "10". Recently Napolskikh demonstrated a proof of a common internal structure of the Fenno-Volgaic and Permian numerals "8" & "9". It is based on an abessive suffix **-tkak-/ *-tkek-* or its Permian variant **-t(k)em-* for adjectives and adverbs, plus a nominal derivational suffix **-sɜ/*-sɛ*. Hence Fenno-Volgaic **kakteksa(n)* "8" < **kakta-tkak-sɜ* "(consisting of) without two", **ükteksä* "9" < **ükte-tkek-sɛ* "(consisting of) without one" and analogically Permian **kɨk-tem-es* & **ȯk-tem-es* (cf. Blažek 1996–97: 14). If we accept this elegant solution, it is evident that the old attempts to identify an Indo-European borrowing in the presumed **-deksan* *"10" in Fenno-Volgaic numerals "8", "9" (already Europaeus 1853 – see Honti 1993: 108–09; cf. Szemerényi 1960: 143) are hopeless. The same can be said about the derivation of Fenno-Volgaic numeral "8" from Germanic (so Diefenbach 1851 – see Joki 1973: 22), or even from proto-Indo-European (Nilsson 1994: 55–56, assuming a substitution **H_3o- > *ka-* in agreement with the conception of Finnish as a 'language preserving laryngeals' of J. Koivulehto; cf. a critical analysis of E. Xelimskij 1995).

Pisani (1980: 47), referring to Brugnatelli, connected the dual **oḱtōu* "8" with the Berber numeral "4", quoting Tuareg (Ahaggar) *ŏkkoẓ* and Guanche *acod/t.* Prasse (1974: 405) reconstructed proto-Berber **hakkūẓ*. The really attested Guanche forms are *acodetti* "4", *acodat-marava* "14" (Gran Canaria ?) and *acot* "9" (Tenerife ?), probably an ellipse from **sumus-acot* "5+4" (Woelfel 1954: 1, 6, 14, 26). The dental stop *d/t* represents undoubtedly an imperfect record of a sound, corresponding to the Berber emphatic **-ẓ-* . The closest cognate seems to be the numeral "9" in some West Chadic languages, analyzable as "4+5": Miya *kučiya*, Siri *bu-kəčuwi* and esp. Ngizim *kúḍkuvḍà* < **kuč*[ ]*baču*, cf. Ngizim *vàaḍ* "5" etc. (Stolbova 1987: 208, 151; Blažek 1990: 39). The Berber-Chadic isogloss **kuč-* "4" is very probably incompatible with the Indo-European numeral "8" (nor with "4").

Seeking a support for the comparison of **oḱtō(u)* "8" and Arabic *ʕašru* "10" (Møller), Pedersen (*IF* 22[1907–08]: 345) speculated about an apparently artificial syntagm **oḱ-tōu en-un̥* *"zehn, zwei (und) eins fehlend".

§3. Conclusion:

The analyzed data can be summarized as follows:

1) The most probable reconstruction of the Indo-European numeral "8" is **H_2oḱtoH_1(u)*.

2) This form represents a dual of *o*-stem **H_2oḱto-*, perhaps syncopated from the original neuter **H_2oḱetom* "a set of points (of one hand)" = "fingers (without thumb)". The plural **H_2oḱeteH_2* > **oḱetā* "sets of points" was reinterpreted into "harrow".

3) The primary etymology starts from the root **H_2oḱ-/*H_2eḱ-* "pointed, sharp".

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INDO-EUROPEAN "nine"

§1. The numeral "nine" is safely attested in all IE branches including some 'Restsprachen'. The most important forms can be projected into the following partial reconstructions allowing their deeper etymological analysis. The symbol **N/ṆN* is used when the reconstruction **m/ṃ* or **n/ṇ* is ambiguous.

Indo-Iranian:

**néwṆ* "9" > Mitanni-Aryan **nava-* in *na-a-wa-ar-ta-an-na, na-wa-ar-ta-an-ni* < **nava-vartana-* "ninth turn"; Old Indic *náva*, Pali *nava*, Hindi *nau*, dial. *nam*, Sinhalese *namaya*, Bashkarik *num & nab*, Kashmiri *nau, nav, nam*, Kati *noh, nu*, Wotapuri *nau*, Ashkun *no* etc.; Avestan *nauua*, Khotanese *nau*, Sogdian *nw'*, Yaghnobi, Wakhi *naw*, Mundji *nau*, Yidgha *nōu*, Yazgulami *nu(w)*, Pashto *nə(h)*, Zoroastrian Pahlavi *nōh*, Modern Persian *nuh* (*-h* according to *dah* "10"), Kurdic Kurmanji *nāh*, Zaza *nau*, Baluchi *no*, Talysh *nàv* etc. In Ossetic and Khwarezmian it is attested only in compounds and derivatives, cf. Digor **næw* in *næw-dæs*, Iron *nū-dæs* and Khwarezmian *nw'δs* "19", while the numeral "9" was replaced by innovations, concretely Ossetic *farast* ("beyond eight"; cf. Avestan *parō* "further") and Khwarezmian *ʃ'δ* (Henning derives it from **frād-* "to increase" > Avestan *frād-*, see Emmerick 1992b: 300). In Old Persian the form **navauva* "Neuntel" can be reconstructed on the basis of the Elamite transcription *nu-ma-u-maš* (Hoffmann, *KZ* 79[1965]: 247–48).

newṆ-mo-* "9th" > Old Indic *navamá-*, Pali *navama-*, Avestan *naoma-*, *nāuma-* (nauuəma-*), Old Persian *n-v-m-* [*navama-*], Khotanese *nauma-*, Sogdian *nwm'y*, Middle Parthian (Tumšuq) *nwwm, n(h)wm*, Zoroastrian Pahlavi *nahom* , Modern Persian *nuhum*, etc.

**newṆ-ti-* "90" > Old Indic *navatí-*, Pali *navuti-*, Avestan *nauuaiti-*, Khotanese *nautä*, Sogdian *nw't*, Khwarezmian *nw(y)c* [*nawic*], Ossetic *næwæʒ(æ)*, Pashto *nawē*, Ormuri *niwē*, Middle & Modern Persian *nawad*, Kurdic *nōt*, etc.

(Abaev 1973: 173–74; Bailey 1979: 192; Emmerick 1992a: 163–184; Id. 1992b: 290–325; in EWAI II: 24–25 and KEWA II: 141–144 Mayrhofer identifies "90" = "Neunzahl" < "Neunheit" while Szemerényi 1960: 62 reconstructs **nawa(n)śant-* "90" in agreement with other IE tens)

Anatolian:

newṆ* "9" > Anatolian **newan-* > ? Hittite **9-*an* "nine(fold)" (?) (cf. **7**-*an* = **septan* ?; on the other hand the record **6**-*an* gives evidence that the complement *-an* is not limited only to the stems where the nasal auslaut is expected; cf. Eichner 1992: 83–84 who prefers to see here the *nt*-stems); Com-

mon Luwian **nuw(y)an-* + *-za* > Hieroglyphic Luwian **nuwi"za* "ninth share" or "that of nine" reconstructed on the basis **9**-*wa/i-i-za/i* (2x Karkamis: A 13 d, 11.3, 4) and **9**-*za/i* (2x Karkamis: A1 a, 1.2) and the syllabic value *nu* of the numerical sign "9" (Morpurgo Davies & Hawkins 1987: 294, fn. 61); cf. also Cuneiform Luwian (nom.-acc. neuter) **9**-*un*, **9**-*za*, **9**-*un-za* (Melchert 1993b: 298; Morpurgo Davies & Hawkins 1987: 294 reconstruct **nun-* + acc. pl.). Lycian nom.-acc. pl. *nuũtãta* "9" (or "90" ? – cf. Melchert 1993b: 298) should reflect Anatolian **néwantontā* (Hajnal 1995: 159–60, fn. 172 & 232, fn. 296; following Melchert he found a plural formation in the ending **-ont(ā)*). In Hittite the *nt*-stem can be identified in both the cardinals, cf. **9**-*an-ti* (dat. sg.) *happešni* "to/on the nine limbs", dat. pl. **9**-*an-da-aš happešnaš šer* "on the nine limbs" etc., and the ordinals, cf. **9**-*an-ti-ma* KASKAL-*ši* "but at the ninth time" and maybe **9**-*ti*-[*ma* ?] MU-*ti* "[but] in the ninth year" (Eichner 1992: 86). In the latter example Morpurgo Davies & Hawkins (1987: 286, 294) saw only a *t*-extension, quoting also Hieroglyphic Luwian **9**-*ti-sa* ANNUS-sa_4 *-si-sa-´* "the ninth (month) of the year" besides **9**-*ta* "nine times" (both examples are from the text from Hısarcik). In Hittite there is also another ordinal **9**-*na* (*KBo* V 2 III 8'). Eichner (1992: 87) speculated about a direct formation 'stem' + 'thematic vowel', i.e. **newn-ó-* > Anatolian **nuná-*. But the phonetic complement *-na* (also **10**-*na* "10th") represents probably a shortened version of the ordinal suffix *-anna-* recognized already by Sommer in 1932 (cf. **5**-*na* vs. **5**-*anna*, **6**-*na* vs. **6**-*anna*, **7**-*na* vs. **7**-*anna* – see Friedrich 1952: 303; Eichner 1992: 82–84), and convincingly analyzed by Watkins (1961: 7–12). Watkins demonstrated a parallelism between the ordinal suffixes **-to-* (Indo-European) vs. *-anna-* (Hittite) and the adjectival suffixes **-to-* (Indo-European) vs. **-e/ono-* (passive participles in Germanic & Slavic, denominal adjectives in Palaic).

(Eichner 1992: 86–87; Tischler 1991: 294)

Armenian:

**H_1new̯N* "9" > **enewn̥* > **enewan* > **inowan* > **inown* (continuing in the pluralized variant *in(n)ownk^c* < **°nes*, gen.-dat.-abl. *in(n)ow(n)c^c*) vs. *inn*, cf. the pluralized variant *tasownk^c* vs. nom. *tasn* "10".

(Szemerényi 1964: 113–14; Winter 1992c: 350)

Peters (1991: 302) rejected Winter's solution for the regular change **-owa-* > **-oga-*, cf. Olsen 1986: 51–56. Eichner (1978: 152, fn. 35) solved this problem assuming a restructuralization **enwn̥* > **enun* under the influence of the ordinal **enun-o-*; similarly Kortlandt 1994: 255. Peters (1991: 304) offered another solution consisting in the loss of **-w-* yet before its change in *-g-*, i.e. **enówan* > **enóan* > **enṓn* > *inown°*. Normier (p.c., July 1998) proposes the following scenario: **H_1néwn̥* > **H_1énwn̥* > **enwun* > **inun* > **inown°*.

Greek:

**H_1(e)n(V)néwN°* "9" > Common Greek **en(V)néwa* > Ionian-Attic *ἐννέα*, Heraclean *ηεννέα* (with *h-* after *ἑπτά*). The presence of *-ϝ-* is safely con-

firmed by the Mycenaean data: nom. sg. f. *e-ne-wo pe-za* (PY 239), nom. du. *e-ne-wo pe-zo = ennewo pedza / pedzō* "with nine feet" (about a table) (Aura Jorro 1985: 219). The final *-o* is a regular continuant of syllabic nasals. The symbol *V* was used for a hypothetical vowel which should be presumed because of its presence in the numeral "90".

There were various attempts to explain the double *-νν-* in the cardinal. Wackernagel (*KZ* 28[1895]: 132–37) derived the numeral from **ἐσνέϝα*, identifying the preposition *ἐς* in **ἐσ-*, cf. *ἐς τρίς* "ungefähr dreimal, gegen dreimal" etc. On the other hand, the preposition is never merged with numerals. Sommer (1951: 27) and Szemerényi (1964: 118) assumed that the tautosyllabic **ἐν-* in **ἐνϝα-* remodelled the expected **ἐνέϝα* in **ἐννέϝα*. Similarly Hamp 1978: 61 saw the origin of the geminate in *ἐννα-* (< **ἐνϝα-*) which is used to form some compounds (*ἐννα-ετήρω* "of nine years"). Beekes (1995: 213) explained the double *-νν-* as follows: **H₁n-* = **ʔn-* > **ʔdn-* (under the influence of **dḗ̯kNt-* "10"; similarly Balto-Slavic **devin*) > Greek **enn°*.

H₁nwN̥-* "9" (in compounds) > Common Greek **enwa-* > Homeric *εἰνά-ετες* (ἐνϝά-ϝετες*) "nine-year-long" etc.

**H₁(e)nwN̥-to-* "9th" > Common Greek **énwn̥tos* > Ionian *εἶνατος*, Attic, Boeotian *ἔνατος*, Cretan, Argolic *ἦνατος*, Lesbian *ἔνοτος*. It is usually explained as an innovation instead of an 'ideal' **ἔνϝανος* (cf. Sommer 1951: 30, 36; Szemerényi 1960: 89 and 1996: 228). On the other hand besides Greek,, the **-to-*suffix also forms ordinals in Albanian, Illyrian, Messapic, Germanic, Baltic, Slavic and Tocharian.

There are numerous attempts to explain the numeral "90": Ionian-Attic *ἐνενήκοντα*, Heraclean *ηενενήκοντα*, Homeric (Od. 19,174) *ἐννήκοντᾰ̄* etc. Therefore Wackernagel (*KZ* 25[1881]: 260) reconstructed **ἐνϝενακοντα*. Brugmann 1892: 498 derived it from **ἐνϝενήκοντα* . Sommer 1951: 36 reconstructs **ἐν(ϝ)ανήκοντα*, identifying a hypothetical ordinal **ἔνϝανος* in the first part. Similarly Szemerényi (1964: 118) who proposed **ἐνεϝανᾰ̄́κοντα* > **ἐνϝανάκοντα* and further **ἐνϝανήκοντα* under the influence of *πεντήκοντα* "50", finally assimilated in **ἐνϝενήκοντα* . Hamp (1978: 61) and Kortlandt (1983: 99) assumed as a starting point **ἐνεϝνη°*. None of the quoted solutions is unambiguous. Hamp and Kortlandt do not explain how **-εϝ-* could have changed into *-ε-*. In the preceding solutions the loss of *-ϝ-* without any compensation is tacitly accepted, although one would expect the same development as in the case of the ordinal. The following reconstruction should better agree with both Greek historical phonology and with the external facts (cf. also §§2, 5.2.): **H₁(e)n[ ]néwN̥-dḗ̯kontH₂* "90" > **H₁(e)n[H₁]néwn̥H₁ḗ̯kontH₂* > **en[e]néwaekonta* > post-Mycenaean Greek **enenéaekonta* > Ionian-Attic *ἐνενήκοντα* etc. (*°ήκοντα* in decads 50–90 after *πεντήκοντα* – see Szemerényi 1960: 25).

(cf. Beekes 1969: 46; Id. 1995: 213–15; Chantraine 2: 349; Waanders 1992: 372–386)

? Macedonian:

*H_2nwN̥- "9" (in compounds) > *anwa- > *an[n]a- > *ana-* in *'Ανά-δραιμος* (**δραμμος* < **d$_{\text{g}}$mmyos*) glossed *'Εννέα ὁδοί* by Stephanus Byzantius (Georgiev 1977: 24–25). Detschew (1957: 17) preferred the Thracian origin of this toponym. Polomé (1986: 185, 187) remained sceptic concerning any Paleo-Balcanian source of *'Ανα-*.

?? Thracian:

*H_1newN̥ > Thracian *enewa[N̥] (?) > *ENEA* in the famous inscription from Ezerovo *ΡΟΛΙΣΤΕΝΕΑΣΝΕΡΕΝΕΑΤΙΑΤΕΑΝΗΣΚΟΑΡΑΖΕΑΔΟΜΕΑΝΤΙΑΕΖΥΙΤΙΤΑΜΙΗΕΡΑΖΗΑΤΑ* if the interpretation of Blumenthal 1933: 113–130 is right:

Thracian:	*Ρῶλις*	*Τενεας*	*νερ*	*ενεα*	*τιλτεαν*	*ησκῶ*	etc.
Greek:	Ρῶλις	Τενεας	ἄρχων	Εννέα	ὁδῶν	εἰμι	etc.

There are numerous other interpretations; only Detschew (1957: 566–82) discussed 16 various solutions published in 1914–38.

Messapic:

*H_1(e)nwN̥t-yo- > *enwatyo- > Messapic *inotθes* "nonus (dies)" (Haas 1962: 105, 214).

? Illyrian:

*newN̥-to- "9th" ? > *neunto-* > personal name *Neunt(i)us* (Hamp, *IF* 81[1976]: 43–44).

Albanian:

**néwN̥-ti-* abstr. *"Neunheit" replaced by f. **newN̥-tā* > **niewatā* > (influenced by **nândë*, originally the ordinal form) > **nân(ë)të* "9" (Tetovo, Sofiko, etc.) > *nëndë* .

**newN̥(o)-to-* "9th" > **nēn-t-* > **nândë* "9" (Ohrid, Arbanasi).

(Hamp, *IF* 81[1976]: 44; Id. 1992: 915–916)

Italic:

**newN̥* "9" > Old Latin *neuen* (early inscription from Ardea; *-n* can be explained as a sandhi change caused by the following word *deiuo*); Classical Latin *nouem.*

**newN̥-o-* "9th" > Old Latin *neuna* (dat. sg. f.; Lanuvium) > **nounos* (cf. Faliscan proper name *Nounis*) > Latin *nōnus*, Umbrian *Noniar* "of Nonia". Szemerényi 1960: 172, fn. 57 mentions de Saussure who followed Curtius in deriving also the ordinal from **nōmus* < **noumos.*

*? **newN̥-mo-* > Umbrian (*Ig* IIa26) *nuvime* "for the ninth time" or "for the last time, latest, newest, novissime". The latter interpretation implies a derivation from the root **new-* "new" (cf. Cowgill 1970: 137, fn. 63, 65).

**newN̥-dḱm̥t-eH₂* "90" > **newN̥dĝm̥teH₂* > **newm̥H₁ĝm̥teH₂* > **neunāgentā* > Latin *nōnāgintā*.

(Coleman 1992: 396, 402, 412–13; Szemerényi 1960: 169 saw the reason of the replacement of the expected **-ḱont-* by **-ḱm̥t-* in the influence of **wīḱm̥tī* "20", **ḱm̥tom* "100")

Celtic:

**newN̥* "9" > Goidelic **nowen* > **noen* > Old Irish *noí*^{N}; Hispano-Celtic **nowan* in *NouanTuTas* = Latin *Nouempopulania*; Brythonic **nawan* > Welsh *nau*, Breton *nao*.

**newm̥* + *-eto-* "9th" > Goidelic **nowametos* > Old Irish *nómad*; Continental Celtic & Brythonic **nawametos* > **nametos* > Gaulish (La Graufesenque) *namet[os]*; Middle Welsh *nafwet*, Middle Breton *nauvet*. The specific Celtic ordinal suffix **-eto-* instead of the usual **-to-* was created because of a wrong division of the numeral "fifth", Old Irish *cóiced*, Gaulish *pimpetos*, Welsh *pymhed* (Szemerényi 1960: 90, fn. 108; Greene 1992: 515).

**newN̥-dḱont-* "90" > **nowu-kont-* or **nawa-kont-* > Old Irish *nócho*.

(Greene 1992: 510–511, 540, 542; de Bernardo Stempel 1987: 131–132)

Germanic:

**newN̥* "9" > Germanic **newun* > Common Nordic **newu/*niwu* > Old Icelandic *níu* "9"; **newun* + *-i-* > **niuni-* > Gothic *niun*, Crimean Gothic *nyne*, Old High German *niun*; **nez̧un* + *-i-* > **niz̧uni-* > **niz̧un* > Old Saxon *nigun*, *nigon*, Old English *nigon*, *nigen* > Middle English *niȝen* > *nien* > English *nine*.

**newŃ̥-to-* "9th" > **ne(w)unþa-* > **niunþa-* > Old English *nioða* (Lindisfarne Gospels) // **nez̧unþa-* > **niz̧unþa-* > Old English *nigoþa*, *nigeþa* besides **newN̥-tó-* "9th" > Germanic **ne(w)unda-* > **niunda-* > Gothic *niunda*, Old Icelandic *nionde*, Old High German *niunte* // **nez̧unda-* > **niz̧unda* > Old Saxon *nigunda*.

**newN̥tí-* "Neunheit" > Germanic **niundi-* > Old Icelandic *niund* "set of nine".

**newN̥-dḗḱm̥t-* "90" > Gothic *niuntehund* besides **newN̥-deḱm̥* "90" > Germanic "9" + **tez̧u[n]* > Old Icelandic *niu tiger*, Old High German *niunzug*, Old English (dat.) *nigontigum* besides the forms where **χunda-* was prefixed: Old English *hundnigontig*, Middle Low German *tnegentich*, Dutch *tnegentig*.

(Ross & Berns 1992: 589–590, 603–610, 619, 651)

Balto-Slavic:

**newN̥* "9" > Balto-Slavic **nevin* > East Baltic **devin* (after **dešimt* "10") > Lithuanian *devyni*, Latvian *deviņi*, dial. *devîņi* (with long **-ī-* after **aštōni* "8" and with adjectival *yo*-declension); Slavic **devę-* in some compounds: **devęsilъ* "Huflattich" (lit. "Neunkraft") > Bulgarian *devesíl*, Serbo-Croatian *dèvèsilj* "Ferula L., Seseli rigidum, Atropa", dial. also *nèvèsilj*, cf. early Lower

Sorbian (1582) *Newessellnyck* = *njewjeselnik* "Pestilenwurz, Petasites" (Schuster-Šewc 1981f: 199; in *n-* Machek 1971: 116 sees an archaism), Old Czech (gloss.) *devěsil* "omastellum, cardisonum, cardopacia, hermodactylus, aggramen" (Prusík 1895: 161 also quotes Czech dial. *nevěsil* "Huflattich") besides *devětsil* "Petasites officinalis", dial. *devěsilé* "Tussilago farfara", Polish *dziewięsił*, Russian *devjasíl* "Clematis recta", Ukrainian *dev'jasýl* "Inula helenium, Carlina vulgaris" etc. (Trubačev, ÉSSJ 4: 221; cf. Vaillant 1958: 634); **devęzъ* > Upper Sorbian *dźewjaz* "Tussilago" (lit. "nine tongues"? – see Trubačev, ÉSSJ 4: 225); **devęsъto* "90" > Old Russian *devęsto* besides **devęnosъto* > Old Russian *devęnosto*, Russian *devjanósto*, Ukrainian *dev'janósto*, Byelorussian *dzevjanósta*, but Old Polish (1420) *dziewiętnosto*. So far the latter form has not been sufficiently explained (cf. recent overviews of Honti 1989: 159–64; Trubačev, ÉSSJ 4: 220; Vasmer 1986: 492). One of tempting solutions assumes the existence of an ordinal-like formation derived by a thematic **-o-* (or adjectival **-(e)no-*, see Vaillant 1958: 645 and cf. Hittite ordinals discussed above) directly from the cardinal, hence **newN̥-(n)o-* > Sl **devęno-*. In a compound with **sъto* "100" it could mean "the nonal hundred" in contrast to 'usual' "hundred" (Comrie 1992: 777 also mentioned traces of the nonal counting in the East Slavic folklore, e.g. Russian *trídevjat' zemel'* "27 countries", *v tridevjatom carstve* "in the 27th kingdom" etc., where "27" = "3 x 9"; cf. also the Turkic examples proposed by Ščerbak 1977: 144, e.g. Turkmen dial. *ikki dokuz* "18" = "2 x 9", Uzbek dial. *üč dokkïz* "27" = "3 x 9" etc.). There are typologically comparable examples of the numeral "9" expressed as "another ten" etc. in Samoyed languages: Samoyed **ämäjtɜm/nə̑* "9" consisting of **ämäj* "other, second" & **ton* "number" (Janhunen 1977: 19, 165), further Nenets *χasawa-juʔ* "9", lit. "man's (= Nenets) ten" vs. *lusa-juʔ* "Russian ten", similarly *χasawa-jurʔ* "90", lit. "man's hundred", vs. *luca-jurʔ* "Russian hundred" etc. (Honti 1993: 202, 206).

Although the anlaut assimilation **newN̥..*dek̂n̥t* > **dęvin* .. **dešiNt* represents the most convincing explanation of this change, there are also other attempts to explain this change: (i) dissimilation **n...*n* > **d...*n* comparable to *Bononia* > Hungarian *Bodon* (Schulze, *KZ* 42[1909]: 27); **H₁neunó-* "9th" = **ʔneunó-* > Balto-Slavic **deunó-* like **Hneb^{h}-* = **ʔneb^{h}-* "cloud" > Baltic **debes-* (Hamp 1979: 144 and 1980: 44; cf. Beekes 1995: 213 quoted above in the Greek section). But why Slavic do **nebo* with *n-* and Greek *νέφος* without the 'prothetic vowel'? IE **-ew-* normally gives Slavic **-ev-* heterosyllabically before a front vowel, and **-ov-* before a back vowel (Comrie 1992: 760).

**newN̥ti-* abstr. "Neunheit" > Old Church Slavic cardinal *devętь* "9". The substitution of an expected **devę* for the abstract noun was undoubtedly also stimulated by the ordinal **devętъ*. Finally, the following numeral **desętь* could have influenced not only the anlaut, but also the auslaut, forming 'Reimwörter'.

**newN̥-to-* "9th" > Balto-Slavic **nevinta-* > Prussian *newīnts* (Smoczyński 1989: 81 assumed that Prussian *n-* need not be an archaism as it is usually interpreted, and sought its origin in the influence of MHG *niunde* "9th"); East

Baltic & Slavic **devinta-* > Lithuanian *deviñtas*, Latvian *devîtais*; Old Church Slavic *devętь*.

(Comrie 1992: 760–61, 776–77; Smoczyński 1989: 78–95; Stang 1966: 279–80; Szemerényi 1960: 64–66; Trubačev, ÉSSJ 4: 220–25)

Tocharian:

**newṇ* "9" > Common Tocharian **ńəwə* > A *ñu*, B *ñū*, *ñu*.

**newṇ-to-* "9th" > Common Tocharian **ñwante* > B *ñunte*.

**newm̥-[d]ḱm̥tH₂* (Winter) or **-[d]ḱonts* > **-kōs* (Klingenschmitt 1994: 329, 404) "90" > **ńəwəmka* > **ñwamka* > B *ñuṁka* & *ñumka*, A *nmuk* (*-uk* after *ṣäptuk* "70", *oktuk* "80").

(Winter 1992b: 112, 121–122, 129–132, 138–139)

§2. Reconstruction:

Brugmann (1892: 481 and 1911: 20, 57) reconstructed two variants: cardinals **néwm̥* & **énwm̥* implying a primary **enewm̥*; similarly ordinals **newm̥to-* & **énwm̥to-*, besides **newm̥no-* and **newm̥mo-* (the latter form should be remodelled after **deḱm̥mo-*). Using laryngeals, the apophonic pair **H₁newm̥* vs. **H₁enwm̥* can be postulated (cf. Coleman 1992: 396 following Benveniste 1935: 152). But there are serious arguments supporting the reconstruction of final **-m̥*: Latin *novem*, Indo-Iranian and Celtic ordinals, and especially Tocharian "90", which cannot be explaind by analogy to **deḱm̥* "10", eventually **septm̥* "7" (Szemerényi 1960: 171–73). Kent (1929: 346) assumed a change **-m̥* > **-n̥* by assimilation in the sequence **°newm̥..*deḱm̥* > **°newn̥..*deḱm̥*. The initial vowel in Greek and Armenian (probably also in Macedonian and Messapic, hypothetically in Thracian) is explained as follows: (1) by metathesis (Pisani, *Ricerche Linguistiche* 2[1951]: 49); (2) as a prothetic vowel (Szemerényi 1960: 89 and 1964: 111); (3) as a vocalized laryngeal **H₁-* (Beekes 1969: 45–46). Regarding the Greek numeral "90" (see above), the maximum reconstruction **H₁(e)n[ ]newṇ*, perhaps **H₁enH₁newm̥*, against the minimum protoform **H₁newm̥* could be proposed. The abstract noun **H₁newm̥tí-* "Neunheit" can also be reconstructed.

§3. Etymology:

3.1. Fay (1910: 422) assumed that the numeral "9" was named after the "right ring-finger". Old Indic *ánāmikā* f. (& *ánāman* m.) "ring-finger" means originally "nameless". The same semantic motivation for the "ring-finger" is very wide-spread in Northern Eurasia. Pott (1847: 284) collected e.g. Lithuanian *bevardis pirštas*, lit. "a finger without name" (cf. also Russian *bezymjánnyj pálec* id.), Finnish *nimetön sormi* (cf. also Mansi *namtal tul'ä*) id., Tibetan *mingmed*, lit. "nameless" etc. In spite of these suggestive facts, Fay derived this Old Indic finger name from the root **nem-* > Old Indic *námate* "bows", hence *ánāmikā* = "inflexible". And still less probable is his conclusion: the startform for the numeral "9", primarily "right ring-finger", was **ne-weno-*

*"nichtgewinnend"! Practically the same interpretation was proposed by Carnoy, (*Muséon* 59[1946]: 568), viz. **ne-w(e)n* = "doigt qui ne peut travailler, ni atteindre" (cf. Szemerényi 1960: 173, fn. 60).

3.2. Also the attempt of Pisani (1932: 166, quoted after Szemerény 1960: 173, fn. 60) to derive the numeral "9" from the root **new-* "to nod" (Pokorny 1959: 767) is not convincing esp. for semantic reasons.

3.3. According to the almost generally accepted point of view, the IE numeral "9" is derived from **new-* "new" (already Benary 1832 – see Debrunner & Wackernagel 1930: 360). The semantic motivation is explained as "new" = "following eight". The numeral **oḱtō(w)* (probably **H₂oḱtoH₁(u)*) "8" is really analyzable as a dual of **oḱto-* (< **H₂oḱ[e]to-*) continuing in Avestan *ašti-* "4 fingers breadth" (Henning 1948: 69).

The most careful internal analysis of the numeral "9" was probably made by Werner Winter in his communication presented at the Jones' conference (Calcutta 1986, published in 1990, pp. 25–26), to appear further in *Voprosy jazykoznanija* (1989/4: 34), and in his synthesis introducing the compendium *Indo-European Numerals* (1992a: 13–14). Winter reconstructed the old heteroclitic paradigm **newr̥* (Armenian *nor* "new", Greek *νεαρός* "youngster") vs. **newn̥* "9". This form is interpreted as an endingless locative of the type Old Indic *udán* "in the water". The presumed meaning "in the new" could have been reinforced by preposing **en* "in" appearing in Greek *εννέα* and Armenian *inn*. The assuption of an addition of **en* provides a neat explanation for the double *-nn-* of Greek *ἐννέα*, but as Winter openly admits, it does not explain the ordinal **ἔνϝατος* which seems to have replaced the expected **ἔνϝανος*.

3.3.1. The main objection to the derivation of **H₁newn̥* "9" from **new-* "new" consists in the different anlaut. Following Peters, Mayrhofer (EWAI II: 25) tried to explain this discrepancy assuming a transmission of the anlaut laryngeal from the preceding numeral "8". But the most probable etymology of the numeral "8" as a dual of **oḱ[e]to-* "set of points (= fingers without thumb) of a hand" (Avestan *ašti-* "the breadth of four fingers"), a derivative of the root **aḱ-/*oḱ-* "sharp, point" (e.g. Greek *ἄκαινα* & *ἄκρα* vs. *ὄκρις* "point"; semantics cf. *ἄκραι χεῖρες* "fingers", *ἄκροι πόδες* "toes" in Herodot I, 119), implies the laryngeal **H₂* (**H₂eḱ-/*H₂oḱ-*).

3.3.2. Perhaps the only attempt to find the semantic motivation "new" → "9" outside IE concerns Egyptian *psḏ* "9" vs. *psḏ(n).tjw* "the new moon and its festival" (Sethe 1916: 20; Loprieno 1986: 1308, 1316, fn. 30, 31). But the "new moon" is more probably derived from the verb *psḏ* "to shine, aufgehen (der Sonne)" while the numeral "9" can be connected with the homonymous *psḏ* "back, spine" accepting the semantic motivation *"(one) back (from ten)" or *"(one) beyond (eight)", cf. e.g. Ossetic *farast* "9" = "beyond 8". It is symptomatic, that the advocates of the relation "new" → "9" among Egyptologists refer just to the widely quoted example of the similarity of IE **new-* "new" and **H₁newn̥* "9". It is logical, a similar tautology cannot be accepted

as a proof. On the other hand, just a typological study of semantic motivation can represent a key to a convincing etymology.

§4. Analyzing the numeral systems in most languages of Eurasia and Africa, there are two most frequent patterns forming the numerals "8" and "9": (i) additive, (ii) subtractive. The following examples can serve as illustrations:

(i) Sumerian *ûs(-su)* "8" < **i-ewes* "5+3" and *i-lim* "9" = "5+4" (Diakonoff, *Journal of the American Oriental Society* 103[1983]: 84–92);

(ii) Finnish *kahdeksan* "8" < Fenno-Volgaic **kakteksan* = **kakta* "2" + **e* negative verb + **k* modal-reflexive suffix + **sä* Px3sg + **n* dual suffix = "two does not exist" and *yhdeksan* "9" < FV **üktesä* = **ükte* "1" + **e* + **k* + **sä* "one does not exist" (UEW 643, 807). Recently Napolskikh proposed a reinterpretation of the preceding etymologies based on the abessive suffix **-tkak-/*-tkek-*, hence **kakteksa(n)* < **kakta-tkak-sɜ(n)* "(consisting of) without two", **ükteksä* < **ükte-tkek-sɛ* "(consisting of) without one" (see Blažek 1996–97: 14). Independently on the chosen approach the Fenno-Volgaic numerals "8" & "9" are formed on the subtractive basis.

The multiplicative pattern for "8" = "4x2" or "2x4" identified also in IE is less common. The analysis of the following numeral "9" could be inspiring for the etymology of the IE numeral "9".

Both patterns appear e.g. in some Uralic languages (cf. Blažek 1996–97: 10):

(a) "**8**": Khanty *ńiləγ*, Mansi *ńolow*, Hungarian *nyolc* (the auslaut after *kilenc* "9") < Ugric **ńalV-(kV-)* < Ugric **ńiljĭ* "4" & **kV* "dual suffix" (Szemerényi 1960: 145; Gulya 1976: 314) vs. "**9**": Khanty **ĕj-ĕrt-jŏŋ* "9" = *"einer vor zehn"; Mansi **ănt-tāl-lŏγ* "9" = *"eine randlose (ohne den Randfinger seiende) zehn" (Honti, *Linguistica Uralica* 26[1990]: 105 and 1993: 179); Hungarian *kilenc* "9" < **kilen-tizĕ* = *"zehn mit Ausnahme von eins", cf. *kívül*, *kül* "draussen, ausser" and *tíz* "10" (MSzFE 2: 366; Honti 1993: 188–92);

(b) "**8**": Nganasan *sitidáta*, Selkup *sittį tettį*, Mator *kiddingteitde*, Karagas *kíddeng déite* "8" < Samoyed **kitā tettə̑* "2x4" vs. "**9**": Nganasan *ŋəńajčumə*, Kamassin *āmiťun* < **ämäjtɜm/nə̑* = **ämäj* "other" + **ton* "number" (Janhunen 1977: 71, 19, 165) or Selkup *ukkɨr čāŋkɨ(n)tɨl'-köt* = "one-missing-ten" and Mator *obde-našta* "one-missing" (Honti 1993: 210, 218; cf. Janhunen 1977: 28, 40–41).

There are also numeral systems forming "8" by way of reduplication "4+4", cf. examples from Bantu languages:

(c) "**8**": Common Bantu **-na* "4" : **-nana* "8" vs. "**9**": Nyang *nɛ́nɛ́námɔ̀t* "9" = *-nɛ̀n* "8" + *-mɔ́t* "1"; Bemba *pabula* "9" : *bula* "not to be"; Mpongwe *enogomi* "9" : *igomi* "10" (Hoffmann, 1952–53: 76).

On the basis of the preceding typological parallels, the following working hypothesis can be formulated: If "8" is derived from "4" (4+4/4x2/2x4), the numeral "9" is more frequently based on subtraction "10 – 1", or on any equivalent pattern ("one missing" etc.), rather than on other models like "8+1" or sim.

§5. This hypothesis based on typological premises should also be applicable on the IE numeral "9".

5.1. It is possible to imagine a syntagm **en-ewn̥* "in lack" (endingless locative ?) consisting of the preposition **en* "in" and the noun **eun-* > Greek *εὖνις*, Old Indic *ūná-*, Avestan *ūna-* "lacking", Armenian *ownayn* "empty", Albanian *û*, gen. *ûni* "hunger", Latin *vānus* "empty", Gothic *wans* "lacking" (see Trombetti 1897: 31 who found an analogy in Old Iudic *ūnaviṁśati-* & *ekonaviṁśati-* "19"; cf. further Pedersen, *IF* 22[1907–08]: 345; the forms are quoted according to Pokorny 1959: 345 & Mann 1984–87: 255). The weakness of this etymology consists not only in morphology, but also in phonology: the most hopeful laryngealistic reconstruction $*H_1uH_2\text{-}n^\circ$ (Peters 1980: 51) is hardly compatible with the protoforms postulated for the numeral "9".

5.2. The most promising solution was probably proposed by Holmer (1966: 37), deriving the IE numeral "9" from IE **ĕneu* "without" (Pokorny 1959: 318). Let us analyze this etymology. Gothic *inu* "without" reflects $*H_1enu$, while its Northwest Germanic counterparts represent the vr̥ddhi grade $*H_1ēnu$: Old Icelandic *án & ón*, Old High German *ânu*, Old Saxon *āno*, Old Frisian *āne*, *ōni* (cf. Hamp 1982: 189). The closest cognates appear in Iranian languages: Khotanese *anau* "without", later *anā*, cf. *anāvu* "isolated", Sogdian *nw-*, Ossetic *ænæ*, Middle Parthian of Turfan *'n'-* "without" (Bailey 1979: 3–4). Greek *ἄνευ* "without" has usually also been included here, but there is no unambiguous point of view on the phonetic prehistory of this word, cf. the following survey of the most recent etymologies:

Hamp (1982: 189) reconstructed $*H_1n̥H_1eu$, interpreting it as an endingless locative of the noun $*H_1enH_1u$- with a probable meaning "lack, want". But one would expect $^+ἔνευ$, cf. *ἐρετμόν* "oar" < $*H_1r̥H_1t^\circ$ (Beekes 1988: 75).

Beekes (1983: 207–08 and 1995: 221) saw the closest cognate in Old Indic *sanu-tár* "away, off, aside", reconstructing $*(s)n̥H_1eu$ besides $*sn̥H_1i$ > Latin **seni* > *sine* "without", Old Irish *sain* "separate", Tocharian A/B *sne/snai* "without".

Dunkel (1988: 111) derived Greek *ἄνευ & ἄνις* from $*H_2n̥$-, differentiating distant deixis in **-u* vs. proximate deixis in **-i*.

Fritz (1995: 199–203) returned to Brugmann's reconstruction **n̥neu*, identifying a negative particle in *n̥-* (1911: 837). The second member of this syntagm should be the root **new(H)-* continuing in Greek *νεύω* "(zu)nicken", Latin *adnuō* "abwinken, verweigern, ablehnen" etc. (Pokorny 1959: 767).

It seems that the Greek word is compatible with its Germanic counterparts only if we accept as the starting point $^+ἔνευ$. The change *ε* > *α* could be caused by the influence of the negative particle *ἀ(ν)-* or by a contamination with *ἄνις* "without" (Megara), perfectly derivable from $*sn̥Hi$- "without" quoted above. The form with original **e-* could be recognized in *ἐνεός* "dumb", if it reflects a compound **enewó-ŏs* "mouthless" (similarly *ἐνεόφρων* "stupid", lit. "senseless"), cf. Old Indic *an-āsa-* "mouthless", metaphorically "speechless" (about Dāsas, cf. RV V29.10: *anā́so dásyūṁr amn̥o vadhéna ní duryoṇá*

āvr̥ṇaṅ mr̥dhrávācaḥ "You slew the speechless Dasyus with the weapon, you threw down into the bad place those who speak contempuously" – see Parpola 1988: 219).

If the preceding thoughts are correct, i.e. the starting point was **ἔνευ* (or *ἄνευ* is incompatible with Gothic *inu*), Hamp's solution can be modified as follows: the analyzed prepositions originate from a hypothetical noun "lack", probably with the hysterodynamic inflection, i.e. with nom. **H₁énu(-s)*, acc. **H₁néwm̥* . It is remarkable and perhaps not accidental that there is the antonym inflected according to the same pattern: **pélH₁u(-s)* "much, many", acc. **pl̥H₁éwm̥* (cf. Beekes 1985: 166). Let us mention that the minumum reconstruction of the numeral "9" and the accusative of the noun "lack" reconstructed above are identical: **H₁newm̥* ! The maximum reconstruction **H₁(e)nH₁newm̥* (> pre-Greek **enenéwa*, syncopated in *ἐννέα*) probably represents a syntagm consisting of the accusative **H₁newm̥* reinforced by the preposition **H₁en-* "in", hence "in lack" (cf. Winter's assumption in §3.3.). Similar formations can be analyzed e.g. in Greek *ἔναντα* "opposite, over against" (**en-antm̥*) or *ἐνῶπα* "face to face" (**en-ōk*m̥*) etc.

§6. Conclusion:

The Indo-European numeral "9" should be reconstructed as **H₁newm̥* & **H₁(e)n-H₁newm̥* (Greek, Armenian, ?Messapic). These forms can represent an accusative of the noun **H₁ĕnu(-s)* probably meaning "lack" or "in lack", judging by the preposition "without" continuing in Germanic and Iranian, possibly also in Greek *ἄνευ* id., if the original form was **ἔνευ* (maybe preserved in *ἐνεός* "dumb", *ἐνεόφρων* "stupid"). It implies that the semantical = arithmetical motivation of the numeral "9" was the subtraction "[one is] in lack".

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INDO-EUROPEAN "ten"

§1. There is only one denotation of the numeral "ten" common for all IE branches. The most important forms can be projected into the following partial reconstructions allowing their deeper etymological analysis.

Indo-Iranian:

**déḱm̥* "10" > Old Indic *dáśa*, Pali *dasa*, Hindi *das*, Kati *duċ*, Waigali *dōš*, Ashkun *dus*, Kashmiri *da(h)* etc.; Median **dasa-* in **dasa-pati-* "decurion", Old Persian **daθa*, Pahlavi and Modern Persian *dah*, Kurdic *däh*, Baluchi *dā*, Semnani *das*, Ormuri *das*, Parachi *dōs*, Old Avestan *dasā*, Khotanese *dasau* with *-au* after *nau* "9" (Emmerick 1992b: 301), *dasa-* in compounds, Sogdian *δs(')*, Yaghnobi *das*, Wakhi *δas*, Sanglichi *dos*, Shugni *δůs*, Yazgulami *δūs*, Yidgha *los*, Pashto *las* etc.

Some middle Iranian source is evident for Permian **das* ~ **däs* "10" and Hungarian *tíz* "10" (Joki 1973: 257, 329–30; Honti 1993: 159, 192–93). On the other hand, there is an old attempt (already Europaeus 1853 – see Honti 1993: 108 and quite recently still Szemerényi 1996: 148) to identify Indo-Iranian (or Indo-European) "10" in Finnish *-deksan* separated from *kahdeksan* "8", *yhdeksan* "9". This interpretation is wrong. The Finnish numerals "8" & "9" are evidently formed by the cardinals *kahte-* "2" and *yhte-* "1" respectively. If they are projected on the Fenno-Volgaic level, it is possible to reconstruct **kakta eksän* "8" and **ükte eksä* "9", interpreted as "two do not exist" and "one does not exist" (cf. Honti 1993: 110). Recently (1997) V. Napolskikh has proposed an alternative solution based on an abessive suffix **-tkak-/*-tkek-*, hence **kakta-tkak-sɜ* "two-without-consisting of" and **ükte-tkek-sɛ* "one-without-consisting of" (see Blažek 1996–97: 14).

**déḱm̥t-* > Old Indic *daśát-* "decade" with an accent shift under the influence of decades (Emmerick 1992a: 194).

deḱ[m̥]mó-* "10th" > Old Indic *daśamá-*, Pali *dasama-*; Avestan *dasəma-*, Khotanese *dasama-*, Ossetic Iron *dæsæm*, Parachi *dōsumī*, Middle Persian (Tumshuq) *dhwm*, Modern Persian *dahum* (daθama*) besides Sogdian *δsm'yk*, Ossetic Digor *dæsæjmag* (**dasamaka*) etc.

**-[d]ḱm̥t(-)* > Old Indic *-śát(-)*, Avestan *-sat(-)* "ten" in decads 20–50;

**-[d]ḱonts* in Avestan *θrisąs* "30"

(Abaev 1958: 359; Bailey 1979: 154; Emmerick 1992a: 170, 194f and 1992b: 301, 308, 324; EWAI I: 708–709; Szemerényi 1960: 68–69 assumed that **déḱm̥* is probably a preconsonantal sandhi-form of **déḱm̥t*).

Anatolian:

dḱm̥to-* "10th" > **deĝm̥to-* > **deyanta-* > Hieroglyphic Luwian *tinata-* "tithe" (Morpurgo Davis & Hawkins, Hethitica 8 [1987]: 283–288); cf. **10-*ta* "tenfold" (Eichner 1992: 88).

**[d]ḱm̥t-ā* > Common Luwian **t'antā́* > Lycian *sñta* "10" (TL 112,6 & 149,9); cf. also **dwi-[d]ḱm̥t-ontā* > Common Lycian **t̰wit'antenta* > Lycian *kbisñtãta* "12" or "20" ? (TL 111,3.4) (cf. Hajnal 1995: 159–60 and Melchert 1993: 64, 34; Melchert thought that *sñta* was abstracted from decades). There is also the form *tusñti* attested in the formulation *ñte ma[h]ãnaha tusñtiti*. In the parallel Greek text it corresponds to *δώδεκα θεοῖς*, it implies the meaning "12" (following Laroche see Eichner 1992: 90–91 who reconstructs *tu-* < **dwo-*). On the other hand, following Shevoroshkin, Melchert 1993: 82 saw here the iterative of the verb *tuwe-* "to place" in the 3rd person plural.

[?]nt-* "10" > Hittite **10-*an-ti-it kalulupit* "the ten fingers" (Eichner 1992: 88).

Eichner (1992: 94) assumed that "the *nt*-derivatives of the basic numerals partly appear to have complex meanings (hence x-*ant-* = "a complex of x parts"). Referring to Melchert, Hajnal 1995: 159–60 said: "**/-nt(ā)/* dient hier zur Pluralbildung (bzw. Individualisierung) von Kollektiv-begriffen..

Let us mention that there was naturally also a special sign for the numeral "10" among Luwian hieroglyphs, namely " — ", besides rare "X" (Meriggi 1962: 165–66, 233, ##379, 382).

Armenian

**dḱm̥ti-* "10" > **tesan* > Arm *-tasan* "-teen" in 11–16 (*i*-stem), *tasn* "10" & "teen" in 17–19.

**-[d]ḱontH₂* > Arm *-sown* in decads '30–90'.

(Winter 1992c: 350–353; Kortlandt 1994: 255 reconstructed **dḱmt*, explaining the vocalism by "adoption of the reduced grade vowel which replaced zero grade vocalism in the ordinal **dḱmto-*").

Greek

**dḱm̥* "10" > Greek *δέκα*, cf. Arcadian *δυόδεκο* "12".

**dekm̥[t]-* > Greek *δεκάς* "decad", cf. acc.pl. *δεκάδας* < **dekm̥dn̥s* < **dḱm̥tn̥s* (Coleman 1992: 433).

**dḱm̥to-* "10th" > Greek *δέκατος*, Arcadian *δέκοτος*, Mycenaean personal name *De-ko-to(-jo)* = *Dekotos*, cf. Lesbian *πεμ[π]εκαιδέκοτος* "15th", *οκτοκαιδέκοτος* "18th".

**-[d]ḱm̥t-* in pre-Greek **ἔϝῑκατι* "20" > Aeolic *(ϝ)ῑ́κατι*, Pamphylian *ϝῑ́κατι*, Heraclean *ϝείκατι*, Laconian *βείκατι*, Homeric *ἐείκοσι* etc.

**-[d]ḱontH₂* "ten" in the decads 30–90 > Greek *-κοντα*.

(Aura Jorro 1985: 165; Kazan. 1986: 151; Waanders 1992: 373–376, 382).

It is remarkable that the linear script B sign — "10" (Bartoněk 1987: 72) and its Hieroglyphic Luwian counterpart are identical.

Illyrian ?

Katičič (1976: 175) found a continuant of the ordinal **dek̑[ɱ̥]mo-* in Illyrian personal names *Dasimius*, *Dasumius*, while Mann (1977: iii, v) compares these forms with Albanian *i dashës* "loving", identifying the numeral "10", better said the ordinal "10th", in the proper name *Decomos*).

Messapic

**dek̑ɱ̥to-/ā* "10th" in acc. **dek̑ɱ̥tām* > *dehatan* "tithe, decimam, δεκάτην" (Haas 1962: 79, 85, 190, 212)

Albanian

**dék̑ɱ̥t* "10" > pre-Albanian **djeθat(V)* > **ɖjéθët(ë)* > **ɖjéët(ë)* > *dhjetë* (Hamp 1992: 916–17)

**-[d]k̑ɱ̥tiH$_1$* in Albanian *-zet* "20" < **ź$^{\text{ü}}$ăti* < **w(i)ĝatī* < **[d]wi-[d]k̑ɱ̥t-iH$_1$* (Hamp 1992: 919; cf. also Huld 1983: 60, 133).

Italic

**dek̑ɱ̥* "10" > Latin *decem*, Umbrian **deseN* in *desenduf* "12". Cf. also Latin *December* < **decumo-mēmbri-* < **dek̑ɱ̥-mēnsri-*.

**dek̑ɱ̥mo-* "10th" > Latin *decumus*, later *decimus*, cf. Faliscan *decimātrūs* "the tenth day after the Ides of the month", and perhaps Latin *decumānus* "tithed", Oscan *dekmanniúís* "for those who have been tithed" or "at the December festival" (loc.).

**dek̑ɱ̥t-* > Oscan n.pl. *degentasiús*, dat.sg. *deketasiúí* "*decentarii" < **dekentāsio-*.

**-[d]k̑ɱ̥tiH$_1$* > pre-Latin **uīkentī* > *uīgintī* "20" (also *ueiginti* – *CIL* 1.1570.6 – < **[d]woi-* ?); cf. also *uicensumam*, *uicensimus*, rarely *uigesimus* "20th" < **-k̑ɱ̥t-tɱ̥mo-*.

**-[d]k̑ɱ̥tH$_2$* "ten" in decads '30–90', the zero-grade probably according to "20".

**deku-* > Lat *decuria* "group of ten", Umbrian *decurier*, *tekuries* "decuriis" (Ig 2B 1); the meaning of *tekvias* is doubtful, cf. perhaps Oscan *vía Dekkvíarím*, where **dekuwio-* could be explained from **dekumio-* (cf. Gaulish of the famous Coligny calendar [DECIO]MIV "from the tenth" restored by Olmsted), while *decu-plus* was probably remodelled after *du-plus* "double"; similarly *centu-plus* etc. Szemerényi (1985: 529–530) rejected the alleged *u*-stem (similarly in Germanic) and saw here an analogical development like in *quinquria* < **quinqueria* < **quinque-wir-iā* , cf. also Old Irish personal collective numerals *triar*, *cethrar*, *coicer* etc. "group of 3/4/5 men", compounded from the numeral plus the word *fer* "man". Recently Olmsted (1988: 293–95) has found the closest cognate to Italic **dekuria* in the Gaulish calendar from Coligny where the form DECVORIV [*dekuorio-*] meant "from the tenth". This Italo-Celtic isogloss is perhaps comparable with Old Indic *daśavāra* "10 times repeated".

**dek̑-* in **dek̑-(s)no-* > Lat *dēnarius* "ten asses"; The distributive *dēnī* could be of the same origin or from **dekemnī*. Lat *decennis* "ten-year-old" refects **dek̑-atni-* , but it could originate via analogy to *biennis* etc.

(Coleman 1992: 396–445; W-H I: 327–29).

The rather puzzling sign **X** used for "10" in ancient Italy is intelligible due to Etruscan alphabet where this sign was read *ś* (< Greek Ξ = [*ks*]), while the numeral "10" was *śar-* (Rix 1969: 853).

Celtic

**dek̑m̥* "10" > Goidelic **dekeN* > Old Irish *deich*^{N}, in composition *deich*^{L} (with exception of the numeral substantive *deichenbor* "ten men"); the form *dēek, dēak* used for teens '11–19' is functionally equivalent to the gen. sg. of decads; there are at least three etymological attempts:

(1) adv. **dwi-penk̑om* or gen. pl. **dwi-penk̑ōm* "twice five" (Pedersen 1913: 133) or dual *dwei-penk̑ou* (Pokorny 1917: 13);

(2) **dekanos* (gen. of Celtic **dekan*) metathesized in **deankos* (Cowgill 1970: 145–46, fn. 1; cf. Greene 1992: 503);

(3) **dek̑m̥-k̑e* "and ten" > Celtic **dekank* > Goidelic **dechāg* > **deēg* > Old Irish *dēec* (Hertz, *Lexis* 4[1955]: 66–69; Schrijver 1993: 181–84). This solution seems to be the most convincing.

Brythonic **dekaN* > Old Welsh *dec*, Welsh *deg*, Cornish, Breton *dek*. In Gaulish the cardinal **decam* appears in the term *decam-noctiacon* "the fest taking ten nights" (Lambert 1994: 132).

The ordinal represents a common Celtic innovation formed by the ending **-ametos*: Hispano-Celtic (Botorrita A10) *TeCameTam* f. acc. sg. (*ā*-stem) "tithe", (A8) *TeCameTinaś* f. acc. pl. "things pertaining to a tithe" (Eska 1989: 105–106); Gaulish (La Graufesenque) *decametos* "10th", (*CIL* XIII 191) *petrudecameto* abl.sg. "14th", Old Irish *dechmad* "10th", Middle Welsh *decvet*, Old Breton *decmet*. Olmsted (1988: 293–95) found further two formations with the ordinal meaning in the famous Gaulish calendar from Coligny, namely [DECIO]MIV = *dek-iomio-*, primarily **dek-omo-*, and DECVORIV = *dekuorio-* (cf. Italic **dekuria* "a group of ten"). Untermann (TBB 156) proposes to interpret the Hispano-Celtic personal name *Teoś* (Botorrita$_3$, II–49) as a shortened form of the ordinal "10th".

**dek̑m̥t(o)-* > Old Irish (Ogam) MAQI DECCEDDAS < **Dekent-os*, cf. the tribal names *Δεκάνται* (Scotland – see Ptolemy II 3, 8), Middle Welsh *Dygent* (*Arx Decantorum* mentioned in 812 AD) (Szemerényi 1960: 169–170).

**dek̑m̥t°-* > Gaulish acc. *δεκαντεμ/ν* "tithe" (Szemerényi, *KZ* 88[1974]: 246–86, Prosdocimi 1986: 214–24 and Schrijver, *Ériu* 44[1993]: 34, fn. 2 reconstructed an **-ā-*stem; according to de Bernardo Stempel 1987: 105, it represented a **-ti-*abstract noun; otherwise Lambert 1996: 86–94).

**-[d]k̑m̥tiH$_1$* > Goidelic **wikentī* "20" > Old Irish *fiche* (*nt*-stem, cf. gen. *fichet*, dat./acc. *fichit*); Brythonic **wikantī* > **ukanti* (remodelled according to **dou uikanti* > Old Welsh, Cornish *douceint* "40" = 2x20 – see Greene 1992:

540, or influenced by the numeral "1" – Old Welsh *un* etc. – regarding the vigessimal system in Brythonic) > Old Welsh *uceint*, Cornish *ugens*, Breton *ugent*; the Gaulish ethnical name *Vocontius*, *Vocontii*, if it really reflects **vo-conti* "20", is remodelled according to the higher decads, cf. the ethnic name *Tricontii* (Szemerényi 1960: 171 quoting Vendryes); the older *a*-vocalism was preserved in the variants *Vocantii*, *Vocanti(s)*. (Plin. XXIX 54; Tac., *Hist.* I 66, 5).

*-[*d*]*ḱont(e)s* > Gaulish *tri-contis*, Old Breton *tri-cont*, Goidelic **trīkonts* > **trīkons* > **trīxōh* > Old Irish *trícho* "30" (see Schrijver, *Ériu* 44[1993]: 42) etc.

(de Bernardo Stempel 1987: 104–105, 110–111; Greene 1992: 503, 510–511, 540–541).

Germanic

**déḱm̥t* "10" > Germanic **teχun* > Gothic *taíhun*, Old Icelandic *tíu*.

**déḱont* > Germanic **teχan* > Old Saxon *tehan*, Old High German *zëhan* "10", Icelandic *-tján* "-teen" etc.

**déḱm̥to-* "10th" > Germanic **teχunða-* > Gothic *taíhunda*, Old Icelandic *tíunde* and Germanic **teχunþa-* > Old English *tēoþa*.

**deḱm̥to-* "10th" > Germanic **teʒunþa-* > Old Saxon *tegotho*, Old Frisian *tegotha*, *tegatha* etc.

**déḱonto-* "10th" > Germanic **teχanða-* > Old Saxon *tehando*, Old High German *zëhanto* etc.

**deḱm̥tmis* (dat. pl.-du.) > Germanic **teʒunðmiz* > **teʒum-* (reinterpreted in the ntr. *u*-stem) > **teʒu-* > Gothic gen. pl. *þrije tigiwe* "30", dat. pl. *saihs tigum* "60", acc. pl. *þrins tiguns* "30", Old Icelandic *tuttugu*, *tottogo* "20" and *-tigr*, pl. *tigir* with all decads from 30 to 110, cf. *tigr*, *tegr* "group of ten", Old Saxon *-tig* "-ty" etc.

(Lehmann 1986: 339, 344; Ross & Berns 1992: 590–593, 602–620, 631–633).

Balto-Slavic

**deḱm̥ti-* "10" > Lithuanian *dešimtìs* (besides indecl. *dẽšimt*), Latvian *desmit*, dial. *desimt*, Prussian *dessempts*, *dessimpts* (an insertion of *-p-* has an analogy e.g. in *wissambs'* = *wissambt(i)s* < **vizamtis* < **vizantis* < Middle High German *wisant / wisent* – see Smoczyński 1989: 85); Old Church Slavonic *desętь*. The original cardinal **deḱm̥*, which would give Baltic **dešin* (Smoczyński 1989: 81, 92–95) and Slavic **desę* (Szemerényi 1960: 111 would prefer **desь*), was replaced by the abstract noun **deḱm̥ti-* "decad" (cf. Albanian above and Old Indic *daśatī* f. "Zehnheit"). Among all Indo-European languages only the Baltic data indicate **-m-*. Its presence could result from a contamination of **deḱm̥* and **deḱm̥°*.

**deḱm̥to-* "10th" > Lithuanian *dešiñtas*, Latvian *desmitais*, Prussian *dessimts* & *dessympts*; Old Church Slavonic *desętь*.

(Smoczyński 1989: 77–96; Stang 1966: 280, 284; Trubačev 1977: 215–17).

Tocharian

**dḱm̥* "10" > Tocharian A *śäkk*, B *(ś)śak*, *śäk* (an alternation *ś* : *ts* [an expected reflex of the palatalized dental stop] appears in the same paradigm, e.g. of the verb A *śuk* "he drunk" vs. *tsuko* "drunk").

**dḱm̥to-* "10th" > Tocharian A *śkänt*, B *śkante* (*śkänte*), acc. *śkäñce*.

**-[d]ḱm̥t[iH$_1$]* > A *wīki*, B *ñkäm̥* "20"; cf. further *ikänte* "20th" (the final *-m̥* could be derived from **-nti* similarly as the 3rd person plural of present and optative verb forms).

**-[d]ḱm̥tH$_2$* (Winter) or **-[d]ḱonts* (Klingenschmitt 1994: 329, 349) > **-kōs* > **-ka* > A *-k*, B *-ka* in decads 30–90, e.g. A *taryāk*, B *täryāka* "30".

(Winter 1992b: 113, 116, 118, 139).

§2. Reconstruction

The traditional reconstruction **dḱm̥t* does not agree with the rules of the IE 'Stammbildung'. It seems to be more purposeful to reconstruct two basic forms: **dḱm̥°* and **dḱm̥t°*. Their derivatives and apophonic variants can be arranged in the following paradigm:

	indeclinable	singular	dual	plural	collective
cardinal	**dḱm̥*	**dḱm̥t*	**[d]ḱm̥t-iH$_1$*	**[d]ḱm̥t-es* or **[d]ḱonts* gen. **[d]ḱm̥t-óm* in **ḱm̥tóm* "100" < **dḱm̥t dḱm̥tóm* "decad of decades"	**[d]ḱónt-H$_2$*
ordinal	**dḱm̥* + *-ó-* (declinable)	**dḱm̥t-ó-*			
abstract noun		**dḱm̥ti-*			

(cf. Eichner 1985: 166–167, who reconstructed the following paradigm: indecl. **dékm̥* : decl. nom. **dékonts*, gen. **dḱm̥tés* "decad", dual **°t-iH$_1$*, plural **°t-es*, comprehensive **°t-H$_2$*).

§3. Analysis of the existing etymologies

3.1. The most popular etymology of the IE numeral "10", traditionally reconstructed as **dḱm̥t*, is **de* "2" & **ḱomt-* "hand" (Thurneysen, *KZ* 26[1883]: 310; Blankenstein, *IF* 21 [1907], 110; W-H 329; Szemerényi 1960: 69; Justus 1988: 533: **"two units/wholes" or even "half a unit"!; a parallel formation appears in Ishkashim, a modern Iranian language from Pamir: *dI dûst* "10" = "two hands" – see Payne 1989: 435). Winter (1992a: 17) correctly mentioned that "...the evidence for a set of forms for "2" without **-w-* is at best shaky". Hittite *t/dān* "for the second time", serving sometimes to prove an existence of a hypothetical IE **do-* "2" (Benveniste 1962: 78), probably reflects **dwoyóm*, cf. Hieroglyphic Luwian *tu-wa-na* "secundum" or "duplicum" (Eichner 1992: 60). Similarly *dammai-* "second, other" is derivable from **dayammai* <

**dwóysmoy* (Puhvel *KZ*, 92[1978]: 103). Winter is also certainly right in his objection that if **dekm̥t* "10" meant "2 hands", it ought to have a dual form like that in the etymon for "8", which means "2 four-finger spans" (*VJ* 1989/4: 37; Id. 1992: 17; cf. Horowitz 1992: 415). On the other hand, the reconstruction **ḱomt-* is based only on Gmc **χanduz* "hand" which has been compared with Gothic *-hinþan* "to grasp" (Lehmann 1986: 176–177). But probably only the reconstruction **k/ḱontú-* is possible. Kent (1929: 343) demonstrated that **-m-*, followed by a dental stop, is preserved in Gothic, cf. *ga-qumþi-* "assembly, synagogue", Old High German *cumft* "arrival" vs. *qiman & coman* "to come", or Gothic *anda-numts* "acceptance", Old High German *numft, nunft* vs. *niman & neman* "to accept" (cf. also Peeters, *KZ* 92[1978]: 27). The Germanic "hand" need not be isolated. There is Albanian *thua* "finger- or toe-nail", derivable from **θoñ* < **ḱēnt-* (Huld 1983: 120). Toporov (1984: 290–291) summarized the discussion concerning Prussian *kuntis* "fist". Hilmarsson (1989: 133–34, fn. 32) interpreted the Tocharian B hapax *kontsai*, perhaps "hands", as a dual of **kontso* < **kont-yōn*, but later he expressed doubts about this tempting etymology ("wortless" – see Hilmarsson 1996: 166).

3.2. W. Brandenstein (1936: 23) offered a quite elegant, but unprovable solution "10" = "bis zur Vollständigkeit" consisting of **de* "bis...zu" & **ḱm̥(t)* "zusammen".

3.3. A. Erhart (1970: 93) saw in it a compound **de-ḱ(o)mt* "1x10", where the original meaning of **ḱomt* was "Gesamheit der Finger". It is in full agreement with the higher decads:

**de-ḱm̥(t)*	"10" = 1x10	cf. Indonesian	*se-puluh*
**[d]wi-ḱm̥t-iH$_1$*	"20" = 2x10		*dua-puluh*
**triH$_2$-ḱomt-H$_2$*	"30" = 3x10		*tiga-puluh*
**k^{w}etur-ḱomt-H$_2$*	"40" = 4x10		*empat-puluh*

The first component **de* was identified by Erhart also in the numeral "2", in his reconstruction **deH^w* = 1x2. It was originally no numeral but rather a deictic particle (cf. Prussian *din* "he", Avestan *dim* "him" etc. – see Toporov 1975: 343). The second component should be connected with Latin *cum* "with", Greek *κάτα* "by, along" (and Hittite *katta*, Gaulish of Chamalières *canti*, Old Welsh *cant* "with"), cf. also Greek *κασί-γνητος* "brother" = **"born together with" < **ḱm̥ti-* (Beekes 1995: 221).

3.4. Shields (1984: 75–80) reconstructed **dekm̥t*, analyzing it as follows: **de* "two" + **-k* 'collective marker' = "two together, pair" + **-n* 'non-sg. suff.' = "large pair" ---> "many".

3.5. Fay (1910: 422–23) interpreted the numeral "10" as **de-ḱm̥* "to end", cf. Greek *-δε* "to" and Old Indic *śám* "(summum) bonum". The ordinal **deḱm̥mo-* supposedly represents a superlative "zu-Ende-meist", cf. Gothic *hindumists* "hindmost", derived by the author from **ḱem-tm̥mo-*. Fay thought

that the meaning "hindmost" etc. is related to the right little finger, the last one of the series. Cf. also Pisani (*RAL* 6/8[1932]: 166 – see Szemerényi 1960: 69, fn. 69) reconstructing **de-ḱom* "ad finem".

3.6. Brugmann (1892: 465, referring to Scherer 1878) and Pedersen (*KZ* 38[1905]: 410) proposed a connection with Greek *δέκομαι* "I accept". Similarly Bengtson (1987: 259) saw the origin of the numeral "10" in the root **deḱ-* "to take, receive, possess, get" (Pokorny 1959: 189–191; Mann 1984–87: 137).

3.7. Horowitz (1992: 411–419) finds in the numeral "10" a pleonastic compound **deḱ-ḱm̥t* "right hand" signifying the completion of a left-to-right progression in finger-counting. It is doubtless a very attractive hypothesis regardless the reconstruction **-ḱm̥t* or **-ḱn̥t* (cf. 2.1.). There is an alternative possibility – a compound **deḱ-* & **mn̥t-* "hand" (Pokorny 1959: 741 – only Germanic), perhaps best explaining the alternation *m* : *n*. Let us mention that Tichy (*Glotta* 54 [1976]: 83) deduced the primary *s*-stem **déḱ-ōs* f. "right hand", later adjectivized in **deḱs-* "right".

§4. *Synthesis*

The first step to a succesful etymology should be a morphological analysis. From this point of view the indeclinable **deḱm̥* looks as an adverb, originally an accusative of a hypothetical root noun, perhaps **dḗḱ(s)* or **dṓḱ(s)* (cf. Greek *πεδά* "nach" vs. *πούς* "foot" – see Brugmann 1911: 742; Beekes 1995: 189 reconstructed a static paradigm for this root noun: nom. **pṓd(s)* vs. acc. **pédm̥*). On the other hand, the form **deḱn̥t* could be interpreted as an *nt*-stem typical for active participles as it was recognized already by Thurneysen, *KZ* 26[1883]: 310 (cf. the paradigm of *nt*-stems: nom. **CéC-n̥t*, acc. **CC-ént-m̥ / *CC-ónt-m̥*, gen. **CC-n̥t-ós*, with ntr. du. $^{\circ}iH_1$ and pl. $^{\circ}H_2$ _ see Beekes 1995: 178). The participle-like *nt*-suffix could express the elative function (cf. Aitzetmüller 1950: 289–96).

Alternatively, the ending **-nt* could represent the 3rd person plural of the verb **deḱ-*. This solution remarkably agrees with the fact that **-e* in IE **pénkʷe* "5" can be identified with the 3rd person singular of the thematic present (cf. Beekes 1995: 228, 233) of the verb continuing in Greek *πέμπω* "I send, convey", *παπάω* "I handle" and maybe Germanic **faŋχan* "to seize" (cf. Winter 1992a: 15; Horowitz 1992: 414, 417, fn. 6).

A more definite solution is hardly possible without a detailed semantic analysis of the root **deḱ-*. There is a wide semantic dispersion. All the following examples could serve as a source of the denotation of the numeral "10":

(1) Khotanese *dāś(ś)-* "to accomplish, finish, cease", cf. *uspurra daśya* "completelly finished" (Bailey 1979: 157); Old Indic *daśā* "condition of life, fate" (Ram.), *daśānta-* "end of life" (Raghuvaṁśa).

(2) Khotanese *dāś-* "to receive (with honor), get (possessions)", cf. Avestan *dasa-* "goods, possessions", *dasaθavant-* "rich" (ibid.);

(3) Khotanese *dāsa-* "collection, heap" : *dās-* "to heap", Ossetic Digor *dasun, dast* "to collect, heap up" (ibid.);

(4) Hittite *dakk-* "to correspond, resemble, conform to", cf. ŠU[$^{HI.A}$ -]*ša-pa* ŠU$^{HI.A}$ *-aš ták-kán-zi* "seine Hände gleichen den Händen" (Tischler 1991: 31);

(5) Greek (Ionic, Aeolic, Cretan) *δέκομαι*, (Attic) *δέχομαι* "nehme an", *δέχθαι* "in die Hand nehmen", (Homeric) *δέκτο* "nahm (ein Opfer) an" (cf. Tichy, *Glotta* 54[1976]: 77, 78);

(6) Gothic *tewai* (dat.) "order, arrangement", cf. *taihun-tewjam* (dat.) "of the ten series"; Langobardic *zāwa* "association", Old English *ǣl tǣwe* "perfect, sound" < Germanic **tĕχw-* (Lehmann 1986: 340, 342);

(7) Old Enlish *teohhian* "to determine, judge", *teoh*, gen. *teohhe* "race, band, troop"; Old High German *gizehōn* "to arrange", cf. Middle High German *zeche* "arrangement, order, society", *ge-zëch* "arranged, joined" (Kluge & Seebold 1989: 807).

The following semantic models are certainly imaginable:

(i) "accomplishing (number), accomplishment" (1) together with the hypothetical adverb **dek̂m* "(ad) finem"; cf. Maya of Yucatan *lah hun* "10", lit. "it finishes one [man]", consisting of *lah* "the end, to end, the whole of anything", or Biloxi *ohi* "10", lit. "completed, filled out" (Stewart 1906: 244, fn. 1).

(ii) "collection, series" → "(determined) number" (3)(6)(7), cf. Fenno-Ugric **luka* "10", orig. "Gezähl, Zahl" (Honti 1993: 120–122), or Old Saxon *hunderod*, Old Icelandic *hundrað* "100/120", *siaurøþr* (= *siautøgr*) "70" etc. (Schmidt 1970: 105) where the second component corresponds to Gothic *raþjo* "account, count, number", Middle Low German *rat* "row", Latin *ratiō* "reason, respect, purpose, account", Persian *radah* "order, rank", Ossetic Digor *radä* "series" (Bailey 1979: 361), cf. also (new) Elamite *ri-ut* "tithe" < Iranian (Hinz & Koch 1987: 1042–43);

(iii) "corresponding (hands)" = "hand" + "hand" (4), cf. OHG *gerade* "aus zwei gleichen Zahlen bestehen" (Seebold & Kluge 1989: 259);

(iv) "(all) grasping" = "(all) fingers" ? (5).

Appendix: Greek *δάκτυλος* "finger, toe; measure"

Brugmann (1900: 284–87) reconstructed Proto-Greek **δάτκυλος* on the basis of Boeotian (Tanagra) *δακκύλιος* "ring, signet". Rejecting the derivation from *δέκομαι* he compared it with Old Icelandic *tindr* "prong, spike, sting", Old High German *zinko* id. < Germanic **tinkko* < **tintkō*. Puhvel (1976: 25–28) tried to demonstrate that Greek *δάκτυλος* is also derived from the numeral "10", accepting Brugmann's reconstruction **δατκύλος* leading via metathesis to the initial form **τκαδ-υλός*, where **τκαδ-* (**dk̂d-*) should represent a more archaic apophonic ancestor of *δεκαδ°*. The suffix *-υλ(ο)-* forms diminutives (*ἀρκτύλος* "bear-cub"), adjectives specializing in roundness (*γογγύλος* "round") or bendability (*ἀγκύλος* "crooked"; cf. *ἀγκύλη* "bend of the arm"). Puhvel assumes a primary meaning **"tenfoldy, (little) one of a decad". Even if the the grammatical analysis of Puhvel may be accepted,

his semantic reconstruction is less plausible. The semantic development "[set of] fingers" > "ten" is more natural than vice versa. If the original meaning of the root **dek̂-* (according to our analysis forming the numeral "ten") was "to reach", it is legitimate to assume the same source for "finger", primarily "reaching" or sim. The same semantic development is imaginable for Latin *digitus* "finger", if it is derived from **decitos*. Finally, Puhvel's attempt to derive the Hittite counterpart *kalul-upa-* "finger, toe" from **dkant-ul°* < **dk̂ɱt-ul°* "tenfold-ness" is quite unconvincing. But if we reconstruct *kalul°* < **ka(n)d-ul°*, there is a hopeful cognate in Greek *κόνδυλος* "Knöchel, Knochengelenk, geballte Faust".

§5. Conclusion

The numeral "10" should be reconstructed in two variants: (a) **dek̂ɱ* and (b) **dek̂ɱt°*. The indeclinable form of the type (a) could be an adverb. The termination **-ɱ* indicates a frozen accusative of a root noun. The form (b) resembles the *nt*-stems so suggestively that it is probably a *nt*-stem (active participle with elative function ?). Both the conclusions imply the root **dek̂-*. Its primary meaning, probably "to reach", allows also to reconstruct the semantic motivation of the numeral "10": "reaching, accomplishing", "what is reached, accomplished" → "in the end". It means that at the time of its creation, the numeral "10" was (became) the last numeral of its series.

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ZCP *Zeitschrift für Celtische Philologie*.

INDO-EUROPEAN "hundred"

For Mirek Čejka with cordial wish to his 100th birthday in 2029

§1. The most important forms of the numeral "100" can be projected into the following partial reconstructions allowing their deeper analysis:

Indo-Iranian:

**ḱm̥tó-* > Indo-Iranian **ćatá-* n. > Old Indic *śatá-* n., Pali *sata-*, Prakrit *sa(y)a*, Bengali, Oriya *sa*, but Panjabi *sau*, *sai*, Hindi *sau*, Awadhi *sau*, pl. *sai*, Old Gujarati *saïṁ*, pl. *saäïṁ* etc.; Shina *šăl*, Mayan *šal*, Kashmiri *hath*; Avestan *satəm*, stem *sata-*, Old Persian **θata-* in the province-name *Θata-guš* (*θtg"uš*) "[land] of hundred cows" (contemporary Panjab), transcribed in Elamite *sa-ad-da-ku-iš* and Akkadian *sa-at-ta-gu-ú* (cf. Old Indic *śatá-gu-* "possessed of a hundred cows", *śata-gv-ín-* "in hundert Rindern bestehend"), further **θata-patiš* "leader of hundred" (Hinz 1973: 154, 168), reconstructed on the basis of Elamite *sa-(ad-)da-bat-ti-iš* "centurion" (Hinz & Koch 1986: 1050, 1057), Scythian **sata-* in personal name *Σατασπης* (Herodot) = "[having] hundred horses", Khotanese *sata-*, Tumshuq Saka *sa*, *saḍa*, Khwarezmian *syd*, Sogdian (Manichean) *st'*, (Christian) *stw*, Middle Parthian of Turfan *sd*, Zoroastrian Pahlavi *sat*, Modern Persian *ṣad* (> Baluchi *saḍ*, Kurdic *säd*), Tajik *sad* (> Sarikoli, Yazgulam, Rošani etc. *sad*, Yaghnobi *sad* & *sat*), Ormuri *sō*, *sū*, Parachi *sȭ*, Sanglichi *sāḍ*, Shugni *īsäd*, Yidgha *šōr*, Wanetsi *sī*, Pashto *sal*, Ossetin *sædæ*, cf. Sarmatian **sada-* attested in personal names *Σαδατος*, *Σαδ^{c}αλος* and Alanian **sada* borrowed in Crimean Gothic *sada* and Balkar *sədə*.

The higher multiplications are formed as follows: Old Indic *dvé śaté* = Avestan *duiie saite*, Khotanese *dvī satã* "200" (neuter dual **dwoy ḱm̥toy*) besides *dviśatám* "200" (neuter collective **"double hundred"), analogically *triśatám* "300" besides *triśatī́* (feminine collective), *trīṇi śatāni* (neuter plural) etc.

(Abaev III: 53; Bailey 1979: 418; Berger 1986: 54; Emmerick 1992a: 176–77 & 1992b: 314, 316; EWAI II: 606; KEWA III: 293)

Anatolian:

There is no safely interpreted form expressing "100" in Anatolian. Meriggi (1936: 267) thought that Lycian *sñta* meant just "100", but later this interpretation was abandoned (Melchert 1993: 64 saw here a meaning "ten" abstracted

from teens or decads, cf. *kbisītata* "20" or "12"; Hajnal 1995: 159 assumed *kbisītata* "20" < proto-Luwian **tuit'antenta* < **dwi-ḱamt-ontā*).

In Hieroglyphic Luwian, Hawkins reads CENTUM-*ni usin* "for 100 year(s)" (*Anatolian Studies* 30[1980]: 147).

Armenian:

The puzzling Armenian *hariwr* "100" is probably of Iranian origin. Bailey 1987: 1–3 has determined the most hopeful source in a middle Iranian word of the type Zoroastrian Pahlavi *harēvāk*, signifying a high number. The syllable *ha-* supposedly reflects **sm̥-* as in Avestan *hazaŋra-* "1000", while the root **-rēva-* probably represents the same as Greek *ἀριθμός* "number" etc. (Pokorny 1959: 60). In this sense Hamp (1955: 144–45) was right, but with a reservation that the relation between Armenian "100" and Greek "number" is only indirect. On the other hand, the attempt of Feydit (1986: 17–19) to demonstrate a borrowing of the Armenian "100" from some "centum" source, starting from the western variant *hayrur* < **hayrowr* < **handrowr* (cf. Armenian *mayri* "lair of badger" vs. Greek *μάνδρα* "stable") < **k'androtr* or sim., cannot be taken seriously.

Greek:

se[m-]ḱm̥tó-* "100" (= "1x100") > Greek *ἑκατόν* (indeclinable), or **sm̥-ḱm̥tó-* > Greek **ἁκατόν* with following change **ά-* > **έ-* under the influence of *ἕν* "1" (n.) (Brugmann, *IF* 21[1907]: 7). In the *-o-* in Arcadian *ηεκοτόν*, an influence of the decads in *-κοντα* has been seen. The alternative solution of Kortlandt (1983: 97–98), who assumes **ἑκατόν* < **H₁ḱm̥tóm* < **dḱm̥tóm* in agreement with the glottalic theory, does not explain the forms such as *τετρακάτιοι* "400" implying an existence of **κατόν*. Another argument supporting this reconstruction can be found in the month name *Βουκάτιος*, used in the calendars of Boeotia, Delphi, Doris, West Locris and Aetolia, and the festival *Βουκάτια* known from Boeotia and Delphi, analyzable as **g"ow-ḱm̥to-* (plus **-yo/a* -extension), corresponding to Old Indic *gośatam* "a present of a hundred cattle", *gośatin-* "possessing a hundred cows". Puhvel (1964: 7–10) saw a convincing support for this interpretation in parallel month names, viz. *'Εκατομβαιών* known from Athene, *'Εκατομβεύς* from Sparta etc., derived from the compound *ἑκατόμβη* "sacrifice [of hundred cows]" (ἑκατόμ-βϝ-ᾱ*), corresponding exactly to Old Indic *śata-gu-* "hundert Rinder besitzend".

(Brugmann 1892: 501–02; Risch 1962: 132; Schwyer 1939: 592; Waanders 1992: 376–77)

Italic:

**ḱm̥to-* "100" > Latin *centum*; cf. also *ducentī* besides *dūcentum* "200", reflecting probably du. n. **d(u)w[oy]-ḱm̥toy* and **dwi-ḱm̥tom* "double hundred" respectively, cf. Old Indic *dvé śaté* vs. *dviśatám* (Waanders 1992: 404). The *r*-derivative *centuria* "Hundertschaft" is probably formed after

decuria (WH I: 201). Albanian *një qind* "one hundred" was borrowed from Latin.

Celtic:

**ḱm̥to-* "100" > Hispano-Celtic (Botorrita) *cantom* (Eska 1989: 54; Meid 1993: 90); Goidelic **kenton* n. > Old Irish *cét*^{N}; gen. *céit*; Welsh *cant*, Cornish *cans*, Breton *kant*; cf. also Gaulish *Canto-bennicus* > Chanturgue, lit. "[district of] hundred horns", and a surface unit preserved in Latin *candetum* < **cant-edom*, lit. "hundred feet" (Lambert 1994: 43, 202).

(de Bernardo Stempel 1987: 96; Greene 1992: 512; Thurneysen 1946: 245)

Germanic:

**ḱm̥tó-* "100" > Germanic n. **χunda"* > Gothic only pl.: nom.-acc. *hunda*, dat. *hundam*, cf. *hunda-faþs* "centurion, captain over 100 men" (= Old Indic *śatá-pati-*); Old English, Old Saxon *hund*, Old High German *hunt* besides the extension in **raða* "number": Old Icelandic *hundrað* "100" (*h. tirøtt*) or "120" (*h. tolfrøtt*); Old English, Old Frisian *hundred*, Old Saxon *hunderod*, Dutch *honderd*, Middle High German *hundert*. Cf. also the derivatives in *-r-*: Old High German *hunteri* m. "captain", *huntari* n. "company" = Old Icelandic *hundari*. Besides the regular continuant of the Indo-European numeral "100", there is a specific Germanic innovation which has been interpreted as "tenty": Gothic *taihuntehund*; Old Icelandic *tío tiger*, Modern Icelandic *tíutíu*; Old English *hundtēontig*, Old High German *zëhanzug*, *zëhanzo*, etc. The same pattern appears in Polabian *disangdisjungt /disą(t)diśǫt/*, undoubtedly under German influence.

(Lehmann 1986: 194–95, 339; Mironov 1963: 367–72, 399; Ross & Berns 1992: 619–20)

Baltic:

Lithuanian *šim̃tas*, Latvian *sìmts* (both m.) "100" are supposed to represent a convincing evidence for **m̥* and not **n̥*. Peeters (1978: 27–28) reminded that they represent the only evidence. Already Kent (1929: 342–46, esp. 345) tried to prove that the 'preservation' of **-mt-* in Baltic is caused by analogy. He reconstructed Baltic **šinta-*, assuming the influence of the numeral "10", i.e. Lithuanian *dešimtìs*, *dẽšim(t)s*, Latvian *desmit(s)*, dial. *desimt*. Naturally, it remains to explain the preservation of **-mt-* in the numeral "10". Here Kent assumed an influence of the ordinal **deḱm̥mo-*, although the really attested Baltic forms reflect **deḱm̥to-*, cf. Lithuanian *dešim̃tas*, early Latvian *desimtaiš*, Prussian *dessīmts*. Perhaps a more hopeful explanation consists in the tendency of the Baltic languages to substitute *-nt-* > *-mt-* or *-nd-* > *-md-*, probably via *-mpt(s)-* or *-mbd(s)-*, or by nasal dissimilation, cf. Prussian variants of "10": *dessimpts*, *dessempts* vs. acc. *dessimton* and further *wissambs*' "aurochs" = */wizamptis/* < Middle High German *wisant/wisent* id., Latvian *stumda* "hour" < German *Stunde* id. etc. (Smoczyński 1989: 85, 100).

Uotila (1990: 137–38) speculated that the Baltic **šinta-* penetrated into Fenno-Volgaic **šinta* (or **činta*) "price, value" (Finnish *hinta* > Lapp *hadd*, Eston *hind*, Mordvin Erzya *čonda* "Kaufpreis für die Braut" – see Keresztes 1986: 159). Unfortunately, Balto-Fennic and Mordvinian do not differentiate the clusters **-mt-* and **-nt-*, hence also this promising parallel does not allow us to decide the question. In any case, there is no safe evidence for the priority of **-m̥-* in Indo-European.

The *r*-derivatives appear in Lithuanian *šimtérgis* "hundred-year-old", *šimteriópas* "hundertartig".

(Comrie 1992: 783–87; Fraenkel 1962–65: 984; Stang 1966: 382; Trautmann 1923: 305)

Slavic:

Common Slavic n. **sъto* "100" (Old Church Slavonic nom. sg. *sъto*, nom. du. in *dъvě sъtě* "200", nom. pl. in *tri sъta* "300", gen. pl. in *pęть sъtъ* "500" etc., attested in all Slavic languages with exception of Polabian; borrowed in Romanian *sută*) is probably the most problematic form among Indo-European denotations of "100". The Slavic **sъto* reflects **ḱutom* while the common Indo-European form **ḱm̥tom* implies Slavic **sęto* (Brugmann 1892: 502; Comrie 1992: 784), alternativelly **sǫto* (Lamprecht 1987: 120–21). There are various attempts to explain this deviant vocalism (the following survey is based on Vasmer & Trubačev III: 762 and Szemerényi 1960: 60–65):

(1) A borrowing from an Iranian source (e.g. Mikkola 1913: 69). But the really attested old Iranian forms reflect **satam* which would give Slavic **soto* (Szemerényi 1960: 65; Comrie 1992: 784).

(2) Šaxmatov thought that ъ appears first in *dъvě sъtě*.

(3) Iljinskij saw here an influence of a Slavic equivalent of Lithuanian *sutis* "heap of stones".

(4) Pisani assumed an *u*-stem of the type **(d)ḱu-to-*.

(5) Szemerényi (1960: 64) proposed early Slavic **devīnsъ(n)* "90" (< **newm̥̄ḱont-*) which had to influence the following expected **sinto*" "100".

(6) Kieckers speculated about **sęsęto* = Greek *ἑκατόν* "one hundred".

Among these more or less problematic solutions two ideas deserve attention. The distant vowel assimilation of the type **dŭvě sĭ"to* > **dŭvě sŭ"to* proposed by Šaxmatov is fully plausible. The following denasalization should have been caused by allegro-pronunciation (Lamprecht 1987: 121; Comrie 1992: 784) or thanks to high frequency of the numeral (Smoczyński 1989: 64). On the other hand, the Kieckers' idea opens a tempting possibility to postulate an exact parallel to the Greek counterpart. The following modification supports his solution: **sŭ-sĭ"to* *"one hundred" or "hundred together" > **sŭsŭ"to* and via haplology **sŭto*. The prefix **sŭ-* means "together" (**s̥m-*, see Pokorny 1959: 903), but also "good, right" (**H₁su-*, see Pokorny 1959: 1037–38; EWAI II: 735–36). In this case the primary meaning of the hypothetical compound **sŭ-sĭ"to* would be *"right hundred", perhaps in opposition to **ty(s)sĭ"t-*

ja ~ *-ont-* (< **tūs-ḱm̥t°* ~ *-ont°*) "1000" if it meant *"(very) thick hundred" or sim. (cf. South Lappish *stuore lukkie* or *stuore tsiekkie* "100" = "big ten" besides proper *tjuödie* "100" and *stuore tjuödie* "1000" = "big hundred" – see Honti 1993: 149–50, 280).

There are also *r*-derivatives: Old Church Slavonic adv. *sъtoricejǫ* "hundertfach", Russian *storíca* (Otrębski 1964: 130–33 assumed a common origin of the **-er-/-or-*derivatives in Slavic, Baltic and Latin).

(Trautmann 1923: 305; Vaillant 1958: 96–97, 645–46; Vasmer & Trubačev III: 761, 767–68)

Tocharian:

**ḱm̥to-* "100" > Tocharian A *känt*, B *kante*, *känte* with recent plural endings: A *käntant(u)*, B *käntenma*

(Van Windekens 1976: 204; Winter 1992b: 122)

§2. Reconstruction and internal structure:

The discussion of the Baltic data legitimate the reconstructions of both **ḱṃtóm* and **ḱm̥tóm*. A more definitive solution depends on its etymology.

The ending **-óm* can represent (i) nom.-acc. sg. or (ii) gen. pl. of the neuter *o*-stem.

The higher multiplications were formed in one of the following two ways:

(a) **d(u)woy ḱṃtoy* du. "200", **triH₂ ḱm̥teH₂* pl. "300" etc.;

(b) **dwi-ḱṃtóm* "200", **tri-ḱm̥tóm* "300" etc., "double hundred", "triple hundred" respectively. These formations are more recent than tens because there are no traces of the lengthening compensating the loss of **d-* here in contrary to tens (Brugmann 1892: 503; Coleman 1992: 404).

§3. Etymology:

1. The most natural solution assumes a relationship to the numeral "10", in our reconstruction **deḱṃ* (originally probably acc. sg.) & **deḱm̥t-* (originally probably active participle). There are two possible patterns (cf. Coleman 1992: 403–04):

1.1. **ḱm̥tóm* < **dḱm̥tóm* represents the gen. pl. of the neuter collective noun **dḱm̥t-* postulated for decads; **dḱm̥tóm* "100" would then be elliptical for *dḱm̥t dḱm̥tóm* "a decad of decades", cf. e.g. Old Church Slavonic *pętь desętъ* "a pentad of decades" or Bari (Nilotic) *mɛrya puök* "100" consisting of *puök* "10" and *mɛrya*, plural of the synonym *mɛrɛ* "10" (Spagnolo 1933: 74).

1.2. **ḱm̥tóm* < **dḱm̥t-ó-m* "100" represents the neuter of a quasi-ordinal form, used elliptically for **dḱm̥t dḱm̥tóm* "decad-tenth", i.e. "tenth ten".

The other attempts based on the numeral "10":

1.3. Szemerényi (1960: 139–40) would expect a starting point in **d(e)ḱm̄ḱont*, a formation characterizing tens, i.e. "tenty". But it is not really attested. That is why he reconstructed **(d)ḱm̄ḱm̥tóm* "ten tens" or "a decad of decades" (cf. 1.1.) and further by haplology **ḱm̥tóm*. Later he returned to

**d(e)ḱm̥ḱómt* shortened to **ḱm̥ḱómt* and further **ḱm̥kóm*, from which **ḱm̥tóm* should originate by dissimilation (Szemerényi 1996: 226; as an illustration of the expected dissimilation he quoted German *Kartoffel* borrowed from Italian *tartuffolo*). There is an interesting structural parallel in the Californian language Yurok (Algonkin-Ritwan family) where *werLerwitsi-werL* "100" means in reality "tenty", cf. *werLerwerit* "10" and further e.g. *merutsi-werL* "50" vs. *meru* "5", *qoxtseutsi-werL* "60" vs. *qoxtseu* "6" etc. (Dixon & Kroeber 1907: 674).

1.4. Olzscha (1968: 149) analyzed **de-ḱm̥t* "10" = "one decad"; the multiplication 10 x 10 had to be expressed **ḱm̥tḱm̥* > **ḱm̥t(o)m.*

1.5. Accepting the same analysis of the numeral "10", Erhart (1970: 94) reconstructed **ḱ(o)m ḱm̥-t-om* "Dekade der Dekaden".

1.6. Mažiulis (1956: 59) proposed that the neuter sg. **ḱm̥tóm* represents a back-formation from the plural **ḱm̥tā́*, originally a collective simplified from the juxtaposition **deḱm̥ deḱm̥t(e)H₂*.

1.7. Jensen (*ZfPh* 6[1952]: 50–57) assumed a segmentation **ḱm̥-tóm*, connecting **-tóm* with Latin collectives in *-tum*, e.g. *arbustum* vs. *arbor*, *cārectum* vs. *cārex* etc. Mažiulis 1956: 58 rejects his solution, because *-tum* is of a participle origin.

2. Stewart 1906: 265 tried to etymologize the numeral "100" on the basis of Old Indic *śam-* "to become tired, finish, stop, come to an end, rest, be quiet" etc., interpreting *śatá-* "100" = "ended". This etymology, semantically perhaps acceptable, does not agree phonetically: the root is **ḱemH₂-* (EWAI II: 611), the participle in the zero-grade **ḱm̥H-tó-* would give **śātá-* like *jātá-* "born" < **ǵn̥H₁-tó-* (EWAI II: 568). Fay (1910: 422–23) developed the idea of Stewart, seeking a source of **ḱm̥tóm* "100" in the root **ḱem-* which supposedly continues in Old Indic *śám* "(summum) bonum, welfare, prosperity" and Gothic superl. (acc.) *hindumisto* "hindmost" < **ḱem-tm̥mo-* (cf. Latin *supremus* "last" and "topmost"). From his point of view, "10" is also related: **de-ḱm̥* "zu Ende" (cf. Greek *-δε* "zu").

§4. External parallels:

4.1. The best known external parallel to the Indo-European "100" appears in Fenno-Ugric **śata* "100" (Finnish, Vote *sata*, Karelian, Lude *sata*, *šata*, Veps, Ingrian *sada*, Livon *sadà*, Estonian *sada*, (S) *sata*; Lappish (Norwegian) *čuotte*; Mordvinian Erzya *śado*, Moksha *śada*; Mari *šüδə*; Udmurt *śu*, Komi *śo*, *śu*; Khanty *sat*, Mansi *šāt*, *sāt*, Hungarian *száz* – see Honti 1993: 124). Its Indo-Iranian origin is generally accepted.

4.2. Fenno-Volgaic **šinta/*šimta* (~ **č-*) "price, value" discussed in the Baltic section above could have been borrowed from Baltic **šimta-* (or **šinta-* ?) "100", although the semantic shift is not trivial.

4.3. Basque *e(h)un* "100", *e(h)untari*, *-dari* "centurion" could have been borrowed from Germanic (Gothic ?, Alamanic ?) – see Naert 1963: 202 following Uhlenbeck (1894).

4.4. Kuipers (1960) admitted that Adyghean & Kabardin *śa* "100" was borrowed from an Indo-European dialect of the *satəm*-provenance. But there are close parallels in other West Caucasian languages: Ubykh *ś*ʷa*, Abkhaz *ś*ʷ-ḳə*, Abazin *ś*ʷ-ḳə* < West Caucasian **ś*ʷV*, further probably related to East Caucasian counterparts (Trubeckoy): Avar-Andi **bišonV*; Lak *tturš*; Dargwa **daršš*; Lezghin **wallš* "100" (Starostin & Nikolaev in NCED 587 reconstructed proto-North Caucasian **Hlŏšwĕ*).

4.5. Møller 1909: 61 compared **ḱn̥tom* "100" with Arabic *hindu'* "a hundred camels, or any hundred, a hundred years (or a little more and a little less, or two hundred)" (cf. also Pedersen, *IF* 22[1907–08]: 346). There are more variants of the Nostratic hypothesis proposing a relationship of Indo-European with other language families including Semitic. But nobody from the advocates of this distant relationship assumes such the phonetic responses implying a relationship of the Arabic word with the Indo-European "100".

4.6. So far nobody has probably mentioned the possibility of a compatibility of Indo-European **ḱn̥tom* and Egyptian *š(n)t* "100". Egyptian *š* corresponds regularly to Semitic **ŝ* (Hebrew *ś*, Arabic *š*). It was already Møller (1909: 62) and recently Bomhard (1984: 225), who tried to demonstrate a regularity of the correspondence of Indo-European **ḱ* and Semitic **ŝ*, cf. e.g. Indo-European **ḱeHr-* "hair" (Old High German *hār*, Lithuanian *šerỹs* "bristle") vs. Semitic **ŝiʕár-* id. (Hebrew *śēʕár*, Arabic *šaʕ(a)r*). The Egyptian numeral is probably derived from *šnj* "to be round" (Loprieno 1986: 1309). In the case of a common heritage the primary sound giving Indo-European **ḱ* and Afroasiatic lateral sibilant **ŝ* could be a lateralized fricative **tɬ* (Bomhard 1984: 156, 183, 224–27). But the eventual relationship does not explain why the Indo-European and Egyptian numerical systems agree only in the numeral "100". The similarity limited to higher numerals indicates a borrowing. Regarding a hopeful internal etymology of the Egyptian numeral, the direction of the borrowing should be Egyptian > Indo-European. If we accept it, one should reject the priority of *centum*-reflexes in Indo-European. We must admit that this isolated argument for such a fundamental reinterpretation is too weak; on the other hand, the contra-arguments appear be convincing: the evident relationship of the Indo-European numerals "100" and "10"; there are practically no other Egyptian borrowings that would have penetrated into the common Indo-European. The opposite borrowing excludes the internal Egyptian etymology and implies a borrowing from some *satəm*-dialect. From the points of view of geography, chronology (the Egyptian numeral is known beginning with the Middle Kingdom) it could be Luwian. But the expected Proto-Luwian continuant **tsa(n)ta(n)* is not too similar to the Egyptian counterpart. It seems that the most simple solution consists in rejecting both the relationship and the borrowing.

§5. Conclusion:

Analyzing various etymologies of the Indo-European numeral "100" (§3), the solutions 1 and 2 appear to be the most convincing.

Concerning the external parallels, the Indo-Iranian origin of Fenno-Ugric **śata* "100" is generally accepted, the Germanic source of Basque *e(h)un* "100" is probable, the Baltic origin of Fenno-Volgaic **šinta* ~ **šimta* (~ **č-*) "value" is possible, the Indo-European origin of Adyghean & Kabardin *śa* "100" is improbable. The similarity of the Indo-European and Egyptian "100's" is very probably only accidental.

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INDO-EUROPEAN "thousand"

§1. There are three various denotations of the numeral "1000" in Indo-European languages. The most important forms can be projected in the following partial reconstructions allowing their deeper analysis:

A. The most widespread term **(sm̥-)ǵʰéslo-* "(one) thousand", or its derivatives are attested in Indo-Iranian, Greek, Latin and Celtic (only Hispano-Celtic):

Indo-Iranian:

**sm̥-ǵʰéslo-* > Indo-Iranian **sa-ǰʰásra-* n. > Old Indic *sahásra-* "1000" n., Pali *sahassa-*, Prakrit *sahassa*, *sahăsa*, Old Awadhi, Old Gujarati *sahasa*, Sindhi *sahasu*, Marathi, Hindi (poetic) *sahas*, Old Sinhalese *jahasa(ka)*, Sinhalese *dās*, *dāha* (*d-* after the multiplication *daha siya* "10 x 100"), Maldivian *hās*, *hāhe*, Kashmiri, Shina *sās*; Iranian **ha-zahra-* n. > Avestan *hazaŋra-* n., Median **hazāra-pati-* "chiliarch", Old Persian **haʒahra-* (?), reconstructed on the basis of the place name known from an Elamite transcription as *Ha-da-ra-an ~ Ha-šá-ra-an* (Hinz 1973: 32–33; Hinz & Koch 1986: 642), Scythian **hazahra-*, reconstructed on the basis of the name *'Αζαρίων* (Abaev 1979: 291 after Vasmer), Khotanese *ysāra-*, Tumshuq Saka *zarɛ*, Manichean Sogdian *z'r*, Khwarezmian, Middle Parthian (Turfan) *hz'r*, Zoroastrian Pahlavi *hazār* (> Armenian *hazar*), Modern Persian *hazār* (> Shugni *hazōr*, Yaghnobi *hazor*, Yazgulam *azor*), Ghilani *həzar*, Kurdic (Kurmanji) *ẖāzar*, Baluchi *azâr*, Ormuri *āzâr*, *zār*, Pashto *zər*, pl. *zarā*, Alanian **azara-* (reconstructed on the basis of Caucasian borrowings: Avar *azar*, Lak *āzar*, Tabasaran *ǧazur*, *āzur*, Lezghin *aǧzur*; Chechen, Ingush *ezar* "1000"; Georgian Pshaw *azari* "hundreds animals killed by hunter"; Hungarian *ezër* "1000" can also be of Alanian origin), Ossetin (epic only) *ærzæ / ærʒæ* "immense number".

Fenno-Ugric **śasra* (> **śarsa*) "1000", continuing in Udmurt *śur(e)s*, Komi *śurs* (> Khanty Obdorsk *śărəs* etc.) and Mansi (North) *sōtər(a)*, (Pelym) *šotər* (Honti 1993: 126–27), is evidently borrowed from Indo-Iranian; it is remarkable that it reflects **ʒʰasra-* without the prefix **sa-* < **sm̥-*.

(Abaev 1958: 187; Bailey 1979: 349–50; Berger 1986: 54; EWAI II: 719–20; Emmerick 1992a: 176 and 1992b: 315; KEWA III: 451–52)

Greek:

**ǵʰesliyo-* > Common Greek **kʰehliio-* (Rix) or **kʰeslio-* (Lejeune) "1000" > Aeolic: Lesbian *χελλιοι*, Thessalian *χελλιας*; Laconian *-χε̄λιω̄ς*, Ionian (Chios) *-χε̄λιων*, *-χειλιων*, Attic *χῑ́λιοι*. The absence of reflexes of

**sm̥-* is intelligible for the plural **χέσλιοι* (Hamp 1968: 277). Frisk II: 1100 reminds us of the primary meaning of this prefix "zusammen mit" and not "eins".

(Chantraine 1968–80: 1260; Frisk II: 1099–1100; Lejeune 1972: 122, 238; Rix 1991: 226; Waanders 1992: 377)

Italic:

Latin *mīllĕ* "1000", abl. *mīllī* (Lucilius), pl. *mīllia*, later also *mīlia* (and even *meilia*, *CIL* 1.638) has been interpreted in various ways:

Sommer (1902: 500) proposed **smī ĝʰslī* "ein Tausendheit" (originally f., later changed in n. under the influence of the numerals "200–900") > **mīllī* (cf. already Fay, *AJPh* 13[1892]: 226–27 and *IF* 11[1900]: 320–22; Sommer 1899: 216; further WH II: 88–89; Coleman 1992: 407 assumed "the replacement of the anomalous nom. sg. f. **-ī* by the regular *i*-stem neuter *-i* to form a neuter noun **mīl(l)ĭ* > *mīlle* and the innovation of a full plural paradigm *mīl(l)ia* ").

Szemerényi (1954: 39 and 1996: 227) reconstructed **smī-ĝʰeslī* > **(s)mīhēli* > **(s)mīhīlī* > **mīlī* > *mīlle*.

Hamp (1968: 274–78) saw the starting-point in the feminine **smī ĝʰesliă* > **mīhesliă* > **mīhehliă* > **mīhliă* > *mīlia*, reinterpreted as pl. n. It implies the sg. **mīhli* > *mille* (cf. the doubts of Coleman 1992: 437–38, fn. 61).

Rix (1991: 226) accepted the reconstruction of Szemerényi **smī ĝʰeslī* (= **smiH₂ ĝʰesliH₂*), but he thought that the form **ĝʰeslī* expressed the appurtenance of the type Old Indic *rathī́* "Wagenkämpfer" vs. *ráthas* "Wagen". The subsequent development should have been as follows: **smīĝʰesli* (in pausa without lengthening) > **mīhēli* > **mīhīle* (with *-e* < **-i* like *mare* < **mari*) > **mīle* (attested in pl. *mīlia*) > *mīlle*, where *-ll-* is supposed to represent only a graphic expression of palatal *l* (cf. already Meillet, *BSL* 19[1915]: 182 and Szemerényi 1954: 40–41). Finally, Rix l.c. proposed a sagacious semantic reconstruction *"ein zu einem **ĝʰeslo-* Gehöriges". Let us mention that already earlier Rix (1969: 850–51) presented a tempting deduction assuming an existence of Old Italic **hēli* "1000" on the basis of Etruscan-Umbrian sign Ø representing both the letter "*h*" and the numeral "1000".

Markey (1984: 287) offered the reconstruction **meH-l-(y)-*, which he derived from **meH-(r̥ /-n-)* "hand, finger" (Latin *manus*, Old Icelandic *mund* "hand" vs. Old Irish *mér* "finger").

Latin "1000" was borrowed into various languages: (i) Albanian (*një*) *mijë*, cf. Arvanitika of Salamis *ñie mille*, Elbasan Tosk (Kristoforidhi) *ñë: miljë* etc. < Common Albanian **miʎë* < Latin pl. *mīlia* (Hamp 1992: 866, 870, 920); (ii) Old Irish *míle*, Welsh, Breton *mil*, Cornish *myl* are also borrowed from the Latin plural *mīlia* (WH II: 88; Greene 1992: 512, 541).

Celtic:

**sm̥-ĝʰesl-* > **san-gles-* > Hispano-Celtic (Botorrita) *śan-Ciliś- /-klis-/* in

acc. pl. *śanCiliśTaŕa*, the fraction in *-to-* "thousandth" (Lambert 1994: 372; cf. also Szemerényi 1994: 98, fn. 2; Eska 1989: 92–93 proposed the translation "a kind or unit of coinage", which is compatible with the interpretation of Lambert, cf. the context *canTom śanCiliśTaŕa* "one hundred *ś.*", i.e. "one hundred coins" which bear the value "thousandth").

B. There is a special term for "1000" common for the 'Northwest block', i.e. for Germanic, Baltic and Slavic. The dispersion of attested forms does not allow to reconstruct both a common 'Northwest' archetype and even an unambiguous Germanic protoform. The following alternative reconstructions depend on the etymological approach:

Germanic:

(a) **tūso-ḱm̥tī* "strong hundred" (Rix 1991: 225; Szemerényi 1996: 227) > Germanic **þūs(a)-χunði* (the reconstruction **tūsḱ°* proposed e.g. by Pokorny 1959: 1083 and also by Comrie 1992: 792 would lead to Germanic **þūsk°*; Szemerényi l.c. demonstrated a regularity of the loss of the stem-final vowel in disyllabic first members of compounds in Germanic, quoting e.g. Gothic *gud-hūs* "temple"). This form is directly attested only in Old Icelandic *þúshund*, cf. also Old Swedish *þūshundrað* (these forms have been sometimes interpreted as innovations originated under the influence of "100").

(b) **tū(s/t)-sm̥t-/-sont-/-sent-* "thick-being" (van Helten 1905–06: 120; Feist 1939: 505–06; Pijnenburg 1989: 104–05, both with rich references) or **tūs-m̥t-/-ont-/-ent-*, a participle of the root **tūs-* "to swell" " (Ross & Berns 1992: 621; the older literature – see Pijnenburg 1989: 100) > Germanic **þūsunðjō-* (Gothic *þūsundi*, Old Icelandic *þúsund*), **þūsanða-* (Old Swedish *þūsand*, Old Danish *thusand*, *thusend*), **þūsinða-* (Runic Swedish *þūsind*, Old Danish *thusind*) or their contamination: Old High German *dûsent*, *thûsent*, later *tûsent*, Middle High German *tûsent*, *tûsunt*, *tûsant*, Old East Low Franconian *thûsint*, Saterland *thusund*, Middle Low German *dûsent*, Middle Dutch *dûsent*, Dutch *duizend*, Old English *þūsend*, Old Frisian *thûsend*, Modern West Frisian *tûzen*, Old Saxon *thûsundig* with *-dig* after *ahtedeg* "80).

Balto-Slavic:

There are two sets of forms: (a) East Baltic, (b) Slavic & Prussian. Their compatibility remains questionable; in the case of East Baltic, even the internal reconstruction is not without problems:

(a) East Baltic **tūstant-* (Leumann 1942: 127; Hamp 1973: 172) > Old Lithuanian gen. sg. *tûstanczios* in Postilė 1599; Old Latvian *tūstuoš-*, besides **tūkstant-* (Stang 1966: 282) > Old Lithuanian acc. sg. *tuxtanti* (1579), Old and dial. Lithuanian gen. sg. *túkstanties*, Modern Lithuanian *túkstantis*, *tū́kstantis* besides older *tukštantis* (Bezzenberger), East Lithuanian *tukstuntis* etc. (Fraenkel 1962–65: 1135), Latvian *tūkstuôt(i)s* besides High Latvian (Kalniena) *tòukstušs*, Latgal (Pilda) *tyùkstuša* etc. (Pijnenburg 1989: 99–100; Karulis II: 436–37).

(b) **tūsḱm̥t-* > Prussian **tūsimtas* (Nepokupnyj 1989: 280), reconstructed on the basis of the acc. pl. *tūsimtons* (III 37_{18}) = **tūsimtans* (Mažiulis 1981: 118, 320); Slavic **tysętji* > Old Church Slavonic (Bulgarian & Old Russian traditions) *tysęšti*, besides **tysǫtji* (**-ont-*) > *tysǫšti* known from the Old Macedonian & Serbo-Croatian traditions (Comrie 1992: 792–93 with overview and analysis of other forms). The reconstruction **tūsm̥t-* is excluded; it would give **tyx°* in Slavic in agreement with the *RUKI*-rule (Vaillant 1958: 647). Trautmann (1923: 332) proposed Balto-Slavic **tūšimtį̄-*, implying **tūḱm̥t°*. This reconstruction is undoubtedly possible, but it does not allow to connect the East Baltic and the West Baltic & the Slavic forms. The unique cluster *-mt-* has been usually explained by the influence of an unattested **simta-* "100" and/or acc. sg. *dessimton*, acc. pl. *dessimtons* "10" (Vaillant 1958: 647), or by nasal dissimilation in the accusative (Smoczyński 1989: 100; he assumed a borrowing of Prussian **tūsint* from Middle High German *tûsent*).

(c) There is a third reconstructible variant, namely on the basis of the Fenno-Volgaic forms borrowed evidently from some Baltic source: Finnish *tuhat*, stem *tuhante-* (> Lappish Inari *tuhhâât*, Kildin *tuafant* etc.), Weps *tuha*, gen. *tuhan*, Livonian *tuan*, Estonian *tuhat*, gen. *tuhande* etc.; Mordvinian Erzya *ťožа*, *ťožov*, Moksha *ťožeń*; Mari (Oržum & East dial.) *tüžem*, (Hill dial.) *təžem*. Because Mari preserved **-m-* in positions **-mC-* and **-m#*, it is possible to reconstruct proto-Fenno-Volgaic **tušamte* (Keresztes 1986: 170; Honti 1993: 126). But the shortened proto-Mordvinian **tuša(m)* and proto-Mari **tüšām* need not be inherited from a common Fenno-Volgaic proto-language, they can represent later borrowings from an early Balto-Fennic.

C. Tocharian:

**welso-* n. > Tocharian A *wälts*, B *yaltse* "1000" (Winter 1992b: 124 reconstructed a thematic derivative based on the stem noun **welos*, gen. **wel-es-os* "greatness"; the development **-ls-* > *-lts-* is regular – see Van Windekens 1976: 102). Earlier Winter (1989: 39, cf. also 1992a: 20) assumed that the suffix A *-ts*, B *-tse* meant "provided with". Van Windekens (1976: 555) derived the numeral from the neuter **weltyo-* (cf. also Hilmarsson 1986: 114).

D. Anatolian:

The reading of the numeral "1000" in Anatolian is not known, only Hittite *LI-IM-aš* KUR-*e-aš* "of a thousand countries" (Eichner 1992: 88). Among Luwian hieroglyphs there was a special sign for "1000" resembling C (Meriggi 1962: 233, # 383; cf. Woudhuizen, *JIES* 23[1995]: 67).

§2. Etymology:

A. There are two mutually excluding etymological approaches:

(a) Following J. Grimm and F. Bopp, Brugmann (1907: 10–12) saw a starting-point in the root **seǵʰ-* "to overcome". From the *es*-neuter **seǵʰes-*

"strength, victory" (Old Indic *sáhas-*, Old Irish *seg* etc.) a **-lo-*adjective **s(e)ĝʰeslo-* could be formed. Brugmann assumed a syntagm **ḱm̥tom s(e)ĝʰeslom* or **s(e)ĝʰeslom ḱm̥tom* *"strong hundred". The missing *σ-* in Greek **χεσλιο-* instead of expected **σχεσλιο-* should have been caused by dissimilation, cf. *πασπάλη* < **σπασπαλη* etc. The main argument against the interpretation of Indo-Iranian **sa-* < **sm̥-* consists in the existence of such compounds as Old Indic *cátuḥsahasram* "4000" or Avestan *po"ru-hazaŋra-* "viele Tausende betragend", instead of an expected **po"ru-zaŋra-*. But Brugmann himself demonstrated that although it is not logical (from a contemporary point of view), it was possible, quoting Greek *τέτταρες ἑκατοντάδες*. Let us mention that the etymology based on **seĝʰ-* also excludes a relationship of Latin *mīlle*. Finally, the Hispano-Celtic form **san-klis-* supports very suggestively the prefix **sm̥-*.

(b) The most hopeful etymological analysis, today representing a *communis opinio*, was summarized by H. Rix (1991: 225–31, especially 226):

**sm̥-ĝʰeslo-* n. "ein **ĝʰeslo-* habend" (Indo-Iranian, probably Hispano--Celtic, yet unknown to Rix)

**smī-ĝʰeslī* f. "ein zu einem **ĝʰeslo-* Gehöriges" (Latin)

**ĝʰesliyo-* adj. "zu einem **ĝʰeslo-* gehörig" (Greek).

But concerning **sm̥-* Rix (1991: 227, fn. 11) mentioned Frisk's notice that in compounds it meant "zusammen mit" (Frisk II: 1100).

In the stem **ĝʰeslo-* Rix l.c. identified the suffix **-lo-*, probably corresponding to the Tocharian gerundive (A *waṣlaṃ* "anziehbar" <.**wos-e-lo-*), the Armenian participle (*gteal* "gefunden" < **wid-e-a-lo-*), the Slavic perfect active participle (Old Church Slavonic *bylъ* "was" < **bʰū-lo-*), further to nomina agentis in Greek (*ὄχλος* "Volkshaufe" < **woĝʰ-lo-*), Latin (*figulus* "Töpfer" < **dʰiĝʰ-lo-*) and Germanic (Old High Germanic *butil* "Büttel" < **bʰudʰ-i-lo-*).

Separating the suffix **-lo-*, the root **ĝʰes-* remains. Its etymology is not evident.

(1) Rix 1991: 228–31 supports the majorite view that it is related to the word for "hand" attested in two suffixal extensions: **ĝʰés-ōr* f., gen. **ĝʰes-r-és* (Anatolian, Armenian, Greek, Albanian, Tocharian) vs. **ĝʰes-to-* (Indo-Iranian, cf. also Latin *praestō* "gegenwärtig zur Hand" and Lithuanian *pažastis* "Achselhöhle"). It is on the basis of this root etymology, that he tried to give precision to his semantic reconstruction:

**sm̥-ĝʰeslo-* "ein Hand habend", i.e. "in eine Hand gehende Menge (von Körnern) habend";

**smī-ĝʰeslī* "ein zu einer Hand gehöriges" (= mit einer Hand fassbares), i.e. "Mass von Körnern";

**ĝʰesliyo-* "zu einer Hand gehörig(e Menge von Körnern)". But the primary meaning of the *sm-*prefix was rather collective than singulative (see the Greek section above).

Following Lehmann, Mayrhofer (EWAI II: 719–20) quoted a clear example of the semantic shift "hand/arm" → "high number", namely East Turkic

(modern Uyghur) *kol* "10.000" vs. Common Turkic **kol* "arm" (Räsänen 1969: 276).

The other etymological attempts are not so convincing:

(2) Pisani (1983: 96–97) derived **ĝʰeslo-* from **eĝʰs-* "out(side)" via metathesis, assuming the primary meaning "ultimate, last", cf. Greek *ἔσχατος*.

(3) Stepanov (1989: 68) saw the starting-point in the Slavic word "password, motto" attested in Ukrainian *háslo*, Polish *hasło*, Czech *heslo* id. and Slovak *heslo* "sound". Machek 1971: 165–66 postulated common Slavic **gъslo*, which should be an *l*-participle of the verb **gъsnǫti*, reconstructed only on the basis of Czech dial. (Moravia) *hesnouti* "to utter a syllable" = common Czech *hlesnout* id. with *-l-* after *hlas* "voice". The Polish word is borrowed from Czech (*h-* !), while the Ukrainian one is borrowed from Polish. It is evident that the word "1000" and the Slavic **gъslo* are incompatible: besides the problematic semantics and root vocalism, the initial velar does not agree either; one would expect **z-*.

(4) Blažek (*ArOr* 62[1994]: 454) tried to demonstrate an existence of a cognate in Slavic **(d)zělъ* with a more primitive semantics, cf. Old Church Slavonic *dzělo* "very, too, at most", *do dzěla* "guite", *prědzělъ* "great", Slovenian *zelo* "very, much", Old Czech *zielo* "frequently". Starting from **zělъ*, the following development would be possible: **źēlo-* < **źeslo-* < **ĝʰeslo-* with an analogical simplification of the cluster **-sl-* as in Slavic **žila* "vein" < **gʷʰīslā*, Lithuanian *gýsla*, Latvian *dzîsla* id., Latin *fīlum* "yarn" etc. (Pokorny 1959: 489). But the Slavic **dz* is not a continuant of **ĝʰ*; it originates from **g* before **ě* in Slavic ('second palatalization', see Vaillant 1950: 50; Lamprecht 1987: 46). So **dzělъ* has been usually derived from **gʰoylo-* "vehement, eager, rank" (Pokorny 1959: 452). It is possible to find more explanations, but none of them is sufficiently convincing: (i) An influence of the 'Reimwort' **cělъ* "whole, healthy, total"; (ii) A secondary depalatalization of the type Slavic **cěva* "spool" vs. Lithuanian *šeivà*, *šaivà* "spool" (cf. Trubačev, ÉSSJ 3: 190–91); (iii) A 'centum' element.

(5) Also the hypothesis of a foreign origin cannot be a priori rejected (cf. Specht, *KZ* 66[1939]: 10f). Rix (1991: 227) added that this solution can be proved only if a hopeful foreign source is identified. Such the source could be found in Sumerian *giš*, *gíš*, *geš*, *géš* "60" (written with the sign DIŠ), *geš-u*, *gíš-u* "600" = 60 x 10 (Dombrowski 1991: 346, 363). A starting-point could have been in (unattested) **geš-u lu* "a quantity consisting of 600" or **geš-u lú* "600 men". Let us mention that in Sumerian, the numeral is normally given after the noun, only in economic texts stands first (Thomsen 1984: 82). The difference in semantics ("600" vs. "1000") would represent a result of a transformation of the Sumerian sexagesimal system into the Indo-European decimal one (cf. Blažek, *ArOr* 62[1994]: 454). On the other hand, the existence of the Emesal counterpart *mu-uš* (Dombrowski l.c.) indicates the primary *g̃* and its substitution by the Indo-European **ĝʰ* seems to be less probable.

B. The 'Northwest' numeral "1000" has been usually interpreted as "thick/strong/big hundred" (Brugmann 1892: 506–07 "Vielhundertheit"; Vasmer & Trubačev IV: 133; Pijnenburg 1989: 100, all with ample references) or a participle of the root **tūs-* (Lühr 1993: 129f starts from the participle **tūsn̥tī* "Anschwellende [Menge]") or **tūt-* + **sn̥t-ī*, a participle of **es-* "to be" (Pijnenburg 1989: 103–05; cf. also Erhart 1982: 138 and critically Lühr 1993: 118).

Every etymology should take into account the following facts: (i) the attested forms really resemble participles; (ii) there are reamarkable traces of the numeral "100" (Old Icelandic, Prussian) or at least of its influence (**-mt-* in Fenno-Volgaic); (iii) the *RUKI* – rule did not operate in Slavic.

The conditions (i) and (ii) are satisfied in the etymologies of Brugmann (1911: 48–49) and Būga (1959: 638; see also Nepokupnyj 1989: 280); Leumann 1942: 127–28 and Hamp 1973: 172–78 respect sufficiently the third one. A combination of both solutions could represent the most promising etymology:

Brugmann and Būga saw a starting point in the syntagm "swelling hundred", consisting of the participle of the root **tū-* "to be strong, thick" extended in *-s-* (Pokorny 1959: 1080–84), plus the numeral "100", which was eliminated in most forms. Hence **tūsn̥t°* (~ *-o/ent-*) + **ḱn̥t°* > Germanic **þūsunð°* [**χunð°*], merged in Old Icelandic *þúshund*, Old Swedish *þūshundraƈ*, besides an elliptic loss of the second member in the others.

Leumann and Hamp found a convincing explanation of the Slavic and Baltic forms assuming the present participle **tūsḱont-* (*-n̥t-* in weak cases). If we combine it with the preceding solution, we get the following development **tūsḱont°* (~ *-n̥t-*) + **ḱn̥t°* > Balto-Slavic **tūsšant°* [**šim/nt°*], merged in Prussian *tūsimt°*, and in another way perhaps in the Fenno-Volgaic borrowing **tušamte*, maybe also in Slavic **tysętji*, if it is not only an apophonic variant to **tysǫtji* where the elliptic loss of the numeral is probable. The East Baltic **tūstant-* corresponds formally to the latter Slavic form with the exception of the specific development leading to the *-sta*-present. Brugmann (1892: 507 and 1911: 49) found the probable primary verb in Latvian *tūkstu* "I become fat, I swell", inf. *tūkt* (more about *-sta*-present see Stang 1966: 341–49). Gauthiot (*IF Anz* 21: 145–46) and Būga (1959: 638) added Lithuanian *tū́kstas* "1000", besides the innovation *tumstas* "1000" (Ašmenà), originally probably "quantity", cf. Lithuanian *tuměti* "gerinnen, konsistent werden", *tumà* "Menge, Masse, Trübheit", *tùmtas* "Schar, Haufe" etc. (Fraenkel 1962–65: 1139; Gauthiot l.c. reconstructed **tūs* "1000" while the form **tūstas* > Lithuanian *tū́kstas* should be the ordinal). There may also be a remarkable parallel in Celtic: Gaulish (La Graufesenque) *tuθ(θ)os* translated as "groupe, masse, total" (Vendryes), "tally" (Whatmough), "Verteilung" (Thurneysen) – see Hirunuma 1988: 39, fn. 2, or "bordereau" (Billy 1993: 150; but according to Lambert 1994: 131–33 "fournée, four"). Hamp (1989: 41) reconstructed **tūθos* < **tūtsos* < **tūs-to-* *"a great or complete number". It suggestivelly corresponds to Lithuanian *tū́kstas* "1000" < **tūsto-*.

Concerning the participle-like *-nt*-suffix, a parallel formation can be found e.g. in Gothic *nehvundja* m.n. "the nearest; neighbor" (Hirt 1896: 347; Brugmann 1911: 49), Lithuanian *gražiũtelis* "very beautiful" vs. *gražùs* "beautiful", *saldiũtelis* "very sweet" vs. *saldùs* "sweet" (**-n̥t-* + dimin. **-eli-*), Latvian *tievītīš* "ganz dünn", *vieglītīš* "ganz leicht" (*-īt-* < **-n̥t-*) or Russian *bol'šuščij* "very big", *tolstuščij* "very thick" (**-ontyo-*) besides *rabotjaščij* "very hard-working" (**-n̥tyo-*), Old Czech *bělúcí* "ganz weiss" (**b^{h}ēlontyo-*), later used with the same function in figura etymologica, e.g. *leta letoucí* "grosse Anzahl von Jahren", *bída bědoucí* "grosses Elend" etc. (Aitzetmüller 1950: 289–96; he also assumed the same origin for the Greek superlatives in *-ατος* and the Hittite adjectives in *-nt-*, e.g. *maklant-* "thin", *warkant-* "fat" etc., cf. also Machek, *ArOr* 17/2[1949]: 138f). These examples indicate an original elative function (cf. Pijnenburg 1989: 103), hence "very strong hundred".

C. Regardless of the concrete reconstruction, it is almost generally accepted to derive the Tocharian numeral "1000" from the root **wel-* (cf. Van Windekens 1976: 555 with older literature) continuing e.g. in Old Church Slavonic *velii* "big", *velьmi* and *velije* "very", Upper Sorbian *wjele* "many, much", Old English, Dutch *wel* "very, fully", Irish *feile-* "very" etc., perhaps also Modern Persian *balī-* "up", *balīdan* "to grow" (Mann 1984–87: 1509).

§3. Conclusion:

Confronting the various forms of the numeral "1000", their reconstructions and etymologies, the following solutions seem to be the most hopeful:

A. The most widespread and probably the oldest term can be reconstructed as follows: Indo-Iranian and Hispano-Celtic **sm̥-ĝ^{h}éslo-* (n.), Latin **smī-ĝ^{h}eslī* (f.), cf. also the adj. **ĝ^{h}esliyo-* reconstructible for Greek. The original meaning could have been "amount [e.g. of corn] that can be held **together in hand(s)**" more probably than "..in one hand".

B. In languages of the 'Northwest' block the numeral "1000" was probably formed by participle-like formations **tūsont- ~ -n̥t-* (Germanic) or **tūsḱont- ~ -n̥t-* (Balto-Slavic) consisting of the root **tū-* (= **tuH- ~ *tewH-* etc.) "strong, thick" extended in **-s-* (Germanic) or **-sḱ-* (Balto-Slavic) and the *-nt*-suffix with elative function plus **ḱn̥t-ī/-yā* , originally probably "belonging to hundred" (later mostly omitted), hence "very strong [hundred]".

C. In Tocharian the numeral "1000" could be derived from the neuter **welos* (*es*-stem) with the original meaning "greatness".

Unfortunately, there are no traces of the numeral "1000" within Anatolian which would help to estimate the age of the invention of this numeral in Indo-European and possibly also the priority of the reconstructed proto-forms.

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PATTERNS OF CREATING NUMERALS

I. Introduction:

It is almost a *communis opinio* that numerals belong to the most stable parts of human speech. The other *myth* is that the internal structure of numerals is analyzable only in 'primitive' languages, while the numerals in languages of the 'developed civilizations' cannot be etymologized. On the basis of etymological studies of various numerical systems, it is possible to demonstrate that concerning changes or borrowings numerals have no privileged position. At present, not only in the 'primitive' languages, but also in the 'civilized' languages the understanding of the internal structure and semantic motivation of numerals depends on the level of etymological research. The most natural source for semantic motivation is the human body, esp. the "hand" and its parts (fingers, spans, joints). Studying the numerical systems based on the body parts terminology and those with transparent internal structure reflecting the primary arithmetic operations, we can not only explain the origin of less intelligible numerals, but also find a solution of the origin of numerals in general.

II. Illustrative examples of various systems of numerals

A. Numeral systems with a transparent semantic motivation:

Telefol (Leontjev) [Trans-New-Guinean phylum of Indo-Pacific macro-phylum]

1 *maakub*	little finger of the left hand	9 *tukal*	left biceps
2 *alob*	ring-finger of the left hand	10 *nakalkal*	left shoulder
3 *asuno*	middle finger of the left hand	11 *kumkal*	left side of the neck
4 *kalbinim*	index of the left hand	12 *tulunkal*	left ear
5 *ookal*	thumb of the left hand	13 *tiinkal*	left eye
6 *bukubkal*	fist of the left hand	14 *mitkal*	nose
7 *bankal*	left forearm	15 *tiin miliifoko*	right eye
8 *ifankal*	left elbow	16 *tulun milifoko*	right ear etc.

Body part tally systems of **Kombai, Korowai & Wambon** [Trans-New Guinean phylum of Indo-Pacific macro-phylum] (compiled by Gvozdanović)

	Kombai	Korowai	Wambon	body-part
1	*raga*	*senan*	*sanop*	little finger
2	*ragaragu*	*senanafill*	*sanop-kunip*	ring finger

	Kombai	Korowai	Wambon	body-part
3	*woraragu*	*pinggu-(lu)p*	*takhem*	middle finger
4	*woro*	*wayafül*	*hitulop*	index finger
5	*abalo*	*wayo*	*ambalop*	thumb
6	*go*	*gédu*	*kumuk*	wrist
7	*khani*	*lafol*	*mben*	lower arm
8	*igabu*	*bonggup*	*muyop*	elbow
9	*rafe*	*labul*	*javet*	upper arm
10	*dodou*	*main*	*malin*	shoulder
11	*ruro* "ear"	*khomofek-holol* "neck"	*nggokmit*	neck
12	*khabiya* "head"	*khotokhal* "ear"	*silutop*	ear
13		*khabéan* "head"	*kelop*	eye

Aghu (Gvozdanović) [Trans-New Guinean phylum of Indo-Pacific macro-phylum]

	numeral	body part		numeral	body part
1	*fasike*		11	*kito wodo*	big toe
2	*okuomu/a*		12	*kito wodo womu*	toe next to the middle toe
3	*okuomasike*		13	*kito efe womu*	toe in the middle
4	*sigiane(mu)*	little finger	14	*kito sigia womu*	toe next
5	*bidikimu/bidikuma*	hand	15	*kito sigia*	little toe
	bifidikimu/a	the one hand		*kitikumu/a*	foot
				kitifikumu/a	the one foot
6	*bidikuma-fasike*	hand + one	16	*afi-kito wodo*	the other big toe
7	*bidikuman-okuoma*	hand + two	17	*afi-kito wodo womu*	the other toe next to big toe
8	*bidikuman-okuomasike*	hand + three	18	*afi-kito efe womu*	the other toe in the middle
9	*bidikuma-sigiane*	hand + little finger	19	*afi-kito sigia womu*	the other toe next to middle toe
10	*bidikuma-bidikuma*	hand + hand	20	*aghu-bigi*	person-bone

Eskimo (Thalbitzer) [Eskaleutan family of Nostratic macro-phylum]

	SW Alaska	meaning / etymology
1	*atauceq*	Al *ataunga* "I unite, join"
2	*malruk*	Gr *mallipa* "follows after him or it"
3	*piŋŋaijun*	Lb *pingalo* "round outgrowth on a tree"
4	*stamin*	WEsk *sitqoq* "knee"
5	*taḷḷimin*	NGr *täḷḷit* "arms"
6	*arFinligin*	WGr *arfaa* "the outer edge of his hand", cf. SWAl *arfirtoa* "I cross over to", hence "6" = *"crossing"
7	*malrunligin*	supplied with two
8	*piŋŋaijunligin*	supplied with three
9	*qolnnunrata*	ten-less
10	*qoln*	WGr *qulaa* "its upper part" etc.
11	*q. ataucimuk cipʃuku*	ten-one-plus; Mc *ataoci-itiaŋélərit* "those that are betoed with one", cf. *itiGaq* "foot"
12	*q. malronuk cipʃuku*	ten-two-plus
13	*q. piŋŋaijunuk cipʃuku*	ten-three-plus
14	*akimiarutu*	fifteen-less
15	*akimiak*	the one at the opposite side

	SW Alaska	meaning / etymology
16	*a. ataucimuk cipʃuku*	fifteen-one-plus
17	*a. malronuk cipʃuku*	fifteen-two-plus
18	*a. piŋŋaijunuk cipʃuku*	fifteen-three-plus
19	*juinanrata*	twenty-less
20	*juinok*	man

Al Alaska, Esk Eskimo, Gr Greenland, Lb Labrador, Mc Mackenzie, N North, S South, W West.

B. Numeral systems with a transparent application of arithmetic operations

B1. Binary systems

Jawony (Donaldson) [Gunwinyguan family of Australian macro-phylum]

1	*ʌnʃiřiň*	
2	*ʃatkuřaŋ*	
3	*ʃatkuřaŋ ʌnʃiřiň*	2 + 1
4	*ʃatkuřaŋ ʃatkuřaŋ*	2 + 2
5	*ʃatkuřaŋ ʃatkuřaŋ ʌnʃiřiň*	2 + 2 + 1

Dhuwal (Donaldson) [Yuulngu family of Pama-Nyungan phylum]

	wangaˈň	
	maařmʌ	
	ļuřkʊn	
	maařmʌ ga maařmʌ	2 + 2
	gooŋ waŋgaˈň	hand-one

San (Tanaka) [Khoi-San macro-phylum]

1	*/wi*	4	*/am/amchira*	2 + 2 or 2 x 2
2	*/ám*	5	*tseu*	= "hand"
3	*ng!ona*			

Haida (Swanton) [NaDene family of Dene-Caucasian macro-phylum]

1	*sgoā'nsîñ*	
2	*stîñ*	
3	*ɬgu'nuɬ*	
4	*sta'nsîñ*	2^2
5	*lē'îl*	
6	*lga'nuɬ*	dual of "3", i.e. 3 x 2
7	*djīguagā'*	
8	*sta'nnsañcha*	2^3
9	*laa'lî'ñgisgoansî'ĭgo*	10 – 1
10	*lā'al*	dual of "5", i.e. 5 x 2

Burušaski (Lorimer) & **Werčikwar** (Berger) [Dene-Caucasian macro-phylum]

	class I-II	III	IV	abstract	Werčikwar	comments
1	*hin*	*han*		*hi(k)*	*hen, han*	
2		*ālta*	*ālto*	*ālti, ālto*	*altán*	
3		*usko*		*Iski*	*iské*	
4		*wālto*		*wālti, wal-*	*wáltu*	2^2
5		*cundo*		*cindi*	*čendó*	
6		*mišindo*		*mišin(di)*	*bišíndu*	[1] + 5
7		*talo*		*tale*	*thaló*	
8		*āltambo*		*āltam(bi)*	*altámbu*	2^3
9		*hunčo*		*hunti*	*huçó*	one subtracted, cf. *hun* "1" after Hayward & Werč. *-cu-* "take away"
10		*tōrumo*		*tōrimi*	*tórum*	

B1.1. In some languages the numerals are organized in pairs:

Old Japanese

1	*fitö*	2	*futa*
3	*mi*	6	*mu*
4	*yö*	8	*ya*
5	*i-tu*	10	*töwo*

Only the numerals *nana* "7" and *kökönö* "9" remain without counterparts. R.A. Miller judges that "9" could represent an old multiplication "3 x 3".

Nama (Böhm) [Khoi-San macro-phylum]

Paired

1	*/gui*	2	*/gaw*	
3	*!nona*	6	*!nani*	but cf. !Gora *!nani-b* "thumb"
4	*haka*	8	*//ḫaisa*	dual *-sa* implicates "4 x 2" ?

Unpaired

7	*hũ*	cf. !Gora *haũ kḫ'ũ* "7" = "4 + ?"	5	*koro*	cf. *kore.p* "palm of the hand"
9	*kḫoese*	*kḫoe* "man" (= 2 hands) + *si* "dorthingehen", i.e. "10 minus"	10	*tisi*	cf. !Gora *kisi* "10"; *-si* ~ dual *-sa*

B2. Ternary systems

Yukaghir of Kolyma (Jochelson) [Nostratic macro-phylum]

1	*irkiei*	
2	*ataxloi*	
3	*yaloi*	
4	*yaloxloi*	3 + 1
5	*iŕyanboi*	= *ńi* "together" & *xańbo* "palm, wrist"

6	*malγi-yaloi*	2 x 3; cf. *malγi* "joint", Tundra Yukaghir *malγur* "on both sides"
7	*purkioi*	"above two"; *pur* "above" & Tundra Yukaghir *kǵji* "2"
8	*malgi-yèloxloi*	2 x (3 + 1)
9	*kun-irki-lejoi*	"ten-one-not being", cf. old record of Maydell *kunalin irkiet oile*
10	*kunel*	the most archaic form is preserved in Omok *kimnel*

Yuma (Langdon & Munro) [Hoka family of Amerindian macro-phylum]

1	*ʔašent*	**ṣiN*	6	*xuumxuuk*	3 x 2
2	*xavik*	**xwak*	7	*paaxkʸee*	**pa-xkʸaai* "them-cross over"
3	*xamók*	**xmuk*	8	*siipxuuk*	4 x 2
4	*cuumpap*	**č-xu-m-pa-p*, cf. Yuman **xupa* "4" = *"both twos"	9	*xamxamok*	3 x 3
5	*saarap*	cf. Yuman **-ṣalʸ* "hand"	10	*šaaxuuk*	**ṣa-xuuk* < **ṣalʸ* & **xwak* "5 x 2"

Sumerian (Diakonoff; Dombrowski)

In Sumerian two systems of counting were used: quinary and ternary.

	Proto-Sumerian		Standard & Eblaite dialects	Emesal = ES (female dial.)	ternal count	ternal count of days
1	**aš*		*aš*			
	**diL(i)*		*diš, dili*	*de*		
	**gʷe*				*ge*	*be* (ES ?)
2	**min / *nim*		*man, min*	*nim*	*daḫ* "addition"	*be-be* 1 + 1
3	**eweš*		*êš*	*am(m)uš*	*PEŠ* "next" ?	*PEŠ*
4	**lim*		*lim(m)-u*		*PEŠ-ge* 3 + 1 *PEŠ-bala* 3 passed	*PEŠ-be* 3 + 1
5	**i(a)*		*i, ia*		*PEŠ-bala-gi₄* 3 passed + 1	*PEŠ-be-be* 3 + 1 + 1
6	**i-aš(-u)*	5 + 1	*âš, a-šu*		*PEŠ-bala-gi₄-gi₄* 3 passed + 1 + 1	*PEŠ-PEŠ* 3 + 3
7	**i-min(-u)*	5 + 2	*imin, umun₇*		*PEŠ-PEŠ-gi₄* 3 + 3 + 1	*PEŠ-PEŠ-be* 3 + 3 + 1
8	**i-eweš(-u)*	5 + 3	*ussu*			*PEŠ-PEŠ-be-be*
9	**i-lim(-u)*	5 + 4	*ilimmu*			*PEŠ-PEŠ-PEŠ*
10	**ḫaw(-u)*	orig. "much"	*u, u₅-wu-mu/wu₄* *eš₁₀*			etc.
20	**ni-aš* or **[mi]n-eš₁₀*	20x1 2x10	*niš, neš*			
30	**eweš-ḫaw* or **ḫaw-eweš*	3x10 10x3	*eš; úšu,ùšu*			
40	**niš-min*	20x2	*nimin, nin₉*			
50	**ninn-u* < **nimin-ḫaw*	40+10	*ninnu*			
60		2x30	*giš, geš, uš*	*mu-uš* *min-eš*		

B3. Quaternary systems

Chumash of Santa Barbara (Dixon & Kroeber) [Hoka family of Amerindian macro-phylum]

1	*paka*	
2	*ickomo*	
3	*masex*	
4	*ckumu*	derived from "2", i.e. "2²"
5	*yiti-paka*	"recur-one"
6	*yiti-ckomo*	"recur-two"
7	*yiti-masex*	"recur-three"
8	*malawa*	cf. Chumash of San Luis Obispo *ckomo* "8" related to "2" & "4"
9	*tspa*	
10	*kel-ckomo*	"plus (?)-two"
11	*tulu*	
12	*masex-eskumu*	3 x 4

B4. Quinary systems

Chukchi (Skorik) [Chukchi-Kamchatkan family of Nostratic macro-phylum]

	numeral	comments
1	*ynnen*	
2	*ŋire-q*	
3	*ŋyro-q*	
4	*ŋyra-q*	
5	*mytlyŋen*	"that-of-hand", cf. *myng-ytlyŋyn* "hand" + singulative
6	*ynnan-mytlyŋen*	1 + 5
7	*ŋer'a-mytlyŋen*	2 + 5
8	*am-ŋiroot*	"just-that-of-three"
9	*qon'a-čgyn-ken*	"that-of-one-[finger]-besides"
10	*myng-yt-ken*	"that-of-both-hands" (cf. dual *myng-yt* "hands")
11	*ynnen parol*	"that-of-both-hands, one redundant"
15	*kylgyn-ken*	derived from "foot"
20	*qlik-kin*	"that-of-man"
30	*qlik-kin myngyt-ken parol*	"that-of-man, that-of-both-hands redundant"
40	*ŋireq-qlik-kin*	"two-of-that-of-man

C. Numerical systems analyzable only using etymological approach. A mixture of the approaches A & B is evident.

Turkic (see above) [Altaic phylum of Nostratic macro-phylum]

1	**bĭr*	Alt **büri*, cf. Mo *büri* "all, each" // MKor *pĭrĭs* "at first"
2	**ękki*	< **eg-(er-)* "to follow" + **-ki* 'ordinal suffix'
3	**ŭč*	orig. perhaps "5", cf. Kyrgyz (in folklor) *qьrqtьn ucu* "200" = "40 x 5"; cf. Koguryŏ *üc* or *utu* and Japanese *itu-* "5"
4	**dŏrt*	cf. Chuvash *ală türt-ĕšĕ* "back part of hand" (> *"four knuckles"); Mo *dör-ben* // Tg **duj-gin* "4"

5	**bēlk*	cf. Tk **bilek* "wrist, forearm" // Mo *bile* "wrist", Ka *bülkᵹ* "forearm" < **bilü-ken* // Tg **bile-(ptun)* "wrist" // MKor *phàr* "arm" < **pàrh*
6	**altï*	cf. Chagatai *al* "front side", i.e. "[1] before [5]" ?
7	**jetti*	cf. Tk **jet-* "to reach, be enough" ? Or cf. Mo *jitüger* "2nd"
8	**sek(k)iꞌ*	< **[e]s-* (cf. Mo *ese* "not to be") + **ękki* "two" + **-ꞌ* 'dual marker'
9	**tokkuꞌ*	cf. Tg **togar* "span; quarter (measure)" // Mo *töge* id.
10	**ōn*	MKor *ón* "100"; cf. Mo *ono-* "to count"
20	**jęgirbi*	cf. MMo *jï'ürme-de-* "to double" < **jïyür-* and Mo **[φ]arban* "10"
30	**ottuꞌ / *oltuꞌ*	Khalaj *hottuz* indicates Alt **pʰ-*; cf. Kor *pottări* "bundle, knot"
40	**k(')ïrk*	? < **kärk* < **ęk(k)i-ꞌ jęgirmi* "2 x 20", cf. Balkar *ēki jïjïrma* "2 x 20"
50	**el(l)ig*	cf. Tk **el(ig)* "hand" and **el(l)ig* "breadth of the palm of hand"
60	**alt-bïl*	prob. to restored in **alt-bïl-ōn* = (1st + 5) x 10
70	**jet-bïl*	prob. to restored in **jet-bïl-ōn* = (2nd + 5) x 10
80	**sek(k)iꞌ ōn*	8 x 10
90	**tokkuꞌ ōn*	9 x 10
100	**jüzꞌ*	< Alt **yeꞌü* "the greatest [number]", cf. Mo *yerü* "the most of..", *yerü-dügen* "for the greatest part", **yer-sün* "9" // MKor *yə́r* "10", *yə̀rə́h* "a big quantity/number" // Old Japanese *yòròdu* "10.000"

Alt Altaic, Ka Kalmyk, Kor Korean, M Middle, Mo Mongolian, Tg Tungusian, Tk Turkic.

Indo-European

Let us recapitulate the conclusions of the preceding analysis of Indo-European numerals:

**[H]oy-(-wo/ko/no-)* "1"	*"one (of two)"; inherited, cf. Semitic **ʔ-w-y/*ʔ-y-y* "be equal"; Samoyedic **oj-* "1"; Altaic **ojV* "only, a single, some"
**pɻH₂- / *sem-* "1"	*"togetherness"; inherited, cf. Altaic **so[m]i̯V* "1"
**pɻH₂-wo-/-mo-* "1st"	*"foremost"; inherited, cf. Semitic **p-r-ʃ* "be first"; Georgian *pirw-el-* "1st"
**du-oy-H₁(u)* "2"	*"2".."one of two"..'dual'; inherited, cf. Altaic **töwi ~ *tüwi* "2"
**H₂el-yo-/-tero-* "2nd"	*"another"; inherited, cf. Ugaritic *ʕl* "second"
**t(e)ri-/*trey-* "3"	*"protruding (finger)", cf. Greek *τέρθρον* "end, point"
**kʷetwōr* "4"	*"set of fingers" or **kʷet-wɻ* "span", metaphorically also "number" ?, derived from **kʷet-* "to stretch" > Lithuanian *kẽsti*, pres. *kečiù* id. besides Russian *četá* "pair", Bulgarian *čet* "number" (= Hittite *kutris-*); Tocharian B *ktakăt* "finger gesture"
**meyu-* (Anatolian) "4"	"less (hand)" or "little (finger)", cf. Greek *μύωψ* "little finger", *μείων* "lesser"
**penkʷe* "5"	"keeps (hand in fist ?)", cf. Greek *πατάω* "I handle" (**pɻkʷ-*)
**Ksweks* "6" < **ĝʰs-weks*	**ĝʰes-* "hand" + **weks-* "grow" = "overgrowing hand"
**septɻ* "7"	< Semitic **sabʕatum* "7", derived from "index", cf. Arabic *sibbat, sabābat, sabbāḥat* "index"; perhaps reinterpreted in the superlative **septɻmo-* "the most honored"
**H₂oḱto-H₁* "8"	"set of points (= fingers or knuckles of hand)" x "2" (**-H₁* = dual), cf. Avestan *aštі-* "breadth of four fingers"
**H₁newɻ* "9"	adv., orig. acc. "in lack", cf. Gothic *inu* "without"
**dekɻ* & **dekɻtʲ* "10"	adv., orig. acc. "in the end" & participle "reaching, finishing", cf. Khotanese *dāś(ś)-* "to finish, accomplish", Greek *δέχθαι* "to take in the hand", *δάκτυλος* "finger"
**H₁wi-H₁ḱɻt-iH₁* "20"	< **dwi-dḱɻt-iH₁* "two decads"

**ḱm̥tom* "100"	< **dḗḱm̥t dḱm̥tom* "decad of decads"
**(sm̥-/smī-)ǵʰeslo-/ī* "1000"	*"amount that can be held together in hand(s)"
**tūs(k)ont-/-m̥t* [& **ḱm̥tī/-yā*] "1000"	*"strongest [hundred]"

Comments:

§1. The teens were usually formed as compounds, frequently without fixed order, sometimes joined by conjunctions or prepositions, cf. Greek *δώδεκα* / Doric *δέκα δύο* / Homeric *δυο-καί-δεκα* "12", Latin *duodecim* / Umbrian *desenduf* / Latin *decem et duo* id. etc. The teens as well as the numerals between tens have been usually transparent because of the current regularization, naturally with certain exceptions. So owing to radical changes in modern Indo-Aryan languages, these numerals represent quite unique forms (Berger 1986: 31f). On the other hand, the Baltic teens and Germanic "11" & "12" are based on the verb **leikʷ-* (~ **leip-* respectively) "to leave" expressing the surplus over ten. The reconstruction of common Indo-European forms for teens is not possible, because they have probably never been firmly established.

§2. The numeral "20" is reconstructible as **H₁wiH₁ḱm̥tiH₁* < **dwi-dḱm̥t-iH₁* via dissimilation in **ʔwidḱ°* and a following assimilation in **ʔwiʔḱ°* (*ʔ* = *H₁*).

For the tens 30–90 the following pattern is probably inherited:

N (= 3, 4, .., 9) x **dḱont-* "decad" + coll. **-H₂* or pl. **-s*.

§3. The ordinals "3rd",..., "10th" have been interpreted as "thematic adjectives formed with **-o-* from the cardinals, with zero grade of the preceding syllable" (Szemerényi 1996: 227). Concerning the primary function of the ordinals there are suggestive parallels e.g. in Kartvelian or Semitic: Georgian *sami* "3" vs. *mesame* "3rd" = *puri* "bread" vs. *mepure* "baker" (nomen agentis, cf. Benveniste 1948: 146) or Arabic *(ʔal-)ḫāmisuⁿ* "(the) fifth", formally the active participle as *qātiluⁿ* "killing" etc. (Cowgill 1970: 119). And one of the functions of the derivatives in *-o-* in Indo-Europrean languages is exactly that of nomen agentis (cf. Brugmann 1906: 148, 155, 163, 608–14). Concerning the most widespread ordinal suffix *-to-*, Szemerényi (1960: 87) assumed the substitution *-o-* → *-to-* which could have been caused by the influence of the ordinal **dḗḱm̥t-o-*, reanalyzed in **dḗḱm̥-to-*. This 'new' suffix was primarily transferred on the ordinal "5th" (**pn̥kʷ-o-* → **pn̥kʷ-to-*, cf. the curious Arcadian *πέμποτος* remodelled after *δέκοτος*). On the other hand, Kuryłowicz (1964: 235) saw in *-t-* "a union-consonant, 'consonne de liaison' between a root-form ending in a semi-vowel and a following vocalic morph", quoting **-kʷr̥-to-* vs. **likʷ-o-*. He added, "the ousting of *-o-* by *-to-* was regular in **dwi-*, **tri-*, **kʷetwr̥-* and was extended to the numerals five and six" (p. 237).

§4. The Indo-European system of numerals was evidently decimal. The traces of duodecimal counting in Germanic (cf. Gothic *taihuntehund*, Old Icelandic *tío tiger*, Old High German *zēhanzo* "100" = "tenty", Old Icelandic *ellefo tiger*, Old English *hundændlæftig* "110" = "eleventy", Old English *hundtwelftig* "120" = "twelfty", besides Old Icelandic *hundrað tirætt* "100",

i.e. "decimal 100", vs. *hundrað tolfrætt* "120", i.e. "duodecimal 100") are derivable from the decimal system, hence they should represent a late innovation.

§5. There are also traces of vigesimal counting in various Indo-European dialects:

A. Indo-Iranian: Kati *vici* "20", *vica-duc* "30" = "20 + 10", *ďu-vəcə* "40" = "2 x 20", *ďu vəca duc* "50" = "(2 x 20) + 10", *trə vəcə* "60" = "3 x 20", *puč vəcə* "100" = "5 x 20", similarly Pashai *wəst* "20", *wəst-o-dăi* "30", *du-wya* "40", *du-wya-u-dăi* "50", *trā-wya* "60", *čār-w(i)ya* "80", *panǰa-wia* "100" etc. (Édel'man 1978: 286–87); Yazgulami *wast* "20", *wast-a δůs* "30", *δow wast* "40", *cůy wast* "60", *penǰ bist* "100" etc. (*bist* is borrowed from Tajiki), Yaghnobi *bist-a das* "30", *dŭ-bist* "40", *dŭ níma bist* "50" ("2^{1}/$_{2}$ x 20"), *tĭráy-bist* "60", *tĭráy níma bist* "70", *tĭfór bist* "80", *tĭfór níma bist* "90", Ossetic Digor *dæs æma insæi* "30", *duvinsæji* "40", *dæs æma duvinsæji* "50", *ærtinsæji* "60" etc., *cupparinsæji* "80", *fonǯinsæji* "100", Baluchi *dō gīst* "40", *sai gīst* "60", *sai gīst u dah* "70", *čīār gīst* "80" etc. (Emmerick 1992: 312–13).

B. Romance: Modern French *soixante-dix* "70" = "60 + 10", *quatre-vingts* "80" = "4 x 20", *quatre-vingt-dix* "90" = "(4 x 20) + 10", but Old French also *vint e dis* "30" = "20 + 10", *deus vins* "40" = "2 x 20", *trois vins* "60" = "3 x 20", *trois vins e dis* "70" etc., further only sporadically: Wallon *quatru-vints* "80", Franco-Provençal (Savoie) *tre vɛ̃* = *trois-vingts*, (Switzerland) *wī vẽ vàtse* = *huit vingts vaches*, Occitan *katre vĩ / bins* "80", occasionally *trés-bints* "60", *cinq bints* "100". Outside the Gallo-Romance area the vigesimal count is well attested in Southern Italy, cf. *dua/tri/quattro vintini* in various Calabrian dialects, *du vintini* "40", *du vintini e ddèci* "50" etc. in Sicily. The vigesimal forms occasionally also occur in Ibero-Romance: *tres vent medidas de farina* "60 measures of flour" (Berceo), *quatro vezes vinte* "4 x 20" (Tras os Montes) (Price 1992: 463–69).

C. Celtic: Middle Welsh *dec ar hugeint* "30" = "10 + 20", Irish *daichead* "40" = "2 x 20", Old Welsh *douceint*, Welsh *deugain*, Breton *daou-ugent* "40" = "2 x 20", Irish *trí fichid* "60" = "3 x 20", already Old Irish *tri fichit fer* "60 men", Middle Welsh *triugeint*, Welsh *trigain*, Breton *tri-ugent* "60" = "3 x 20" etc. (Lewis & Pedersen 1937[54]: 238, §334.3; Price 1992: 466).

D. Germanic: Danish *halvtreds* "50", *tres* "60", *halvfjerds* "70", *firs* "80", *halvfems* "90", Old Danish *halfthrithiætiugh* "50", *thry(s)tiugh(æ)* "60", *halffiærthætiwgh* "70", *fivghærtivghæ, firætiughæ* etc. "80", *halffemtesintyuge* etc. "90", *femsyndetiuge* "100" (Ross & Berns 1992: 616–19).

The presence of the vigesimal counting in Indo-European languages has been explained differently: (a) spontaneous independent innovation; (b) foreign import; (c) substratal origin (cf. the discussion in Price 1992: 466–69). The distribution of the vigesimal system is in a remarkable correlation with the existence of the non-Indo-European languages for which the vigesimal system is characteristic. The Indo-Iranian languages with the vigesimal count are spoken in the area of Hindukush and Pamir mountains where the influence of the substratal population represented by Burushaski is evident (cf. *a'ltər*

"20", *a lto wa ltər* "40", *a lto wa ltər to rʊmo* "50", *i ski a ltər* "60", *i ski a ltər to rʊmo* "70", *wa lti a ltər* "80" etc. – see Lorimer 1938), or in the area of the Caucasus mountains where the influence of languages with the vigesimal system is also documented (e.g. Georgian *oci* "20", *oc-da-ati* "30", *or-m-oci* "40", *ormoc-da-ati* "50", *sam-oci* "60", *samoc-da-ati* "70", *otx-m-oci* "80", *otxmoc-da-ati* "90" or Avar *q̇q̇ógo* "20", *ḳi-q̇q̇ógo* "40", *ḳi-q̇q̇oyalda-ançgo* "50", *λáb-q̇q̇ogo* "60", *λáb-q̇q̇oyalda-ançgo* "70", *ʕan-q̇q̇ogo* "80", *ʕan-q̇q̇oyalda-ançgo* "90"). The presence of the vigesimal count in Romance, especially Gallo-Romance, has been explained from Gaulish. But in the known fragments of Gaulish there are no traces of the vigesimal system, cf. *tricontIs* "30", *ox*[*oc*]*antia* "80" (see Olmsted 1988: 296). A much more probable source seems to be Aquitanian or other ancient language related to Basque where the vigesimal count is familiar (cf. *hogei* "20", *hogei eta hamar* "30", *berrogei* "40", *hirurogei* "60", *laurogei* "80" etc.). The vigesimal count in the insular Celtic languages could also have been borrowed from the substratal language(s) of the British Isles, perhaps related to the pre-Indo-European languages of the Iberian peninsula and Southern France. The presence of the vigesimal system in Danish is puzzling. It could have been stimulated by contacts of the Normans with British Isles and / or Northern France. Let us mention that it were the Normans who brought the vigesimal count into Sicily and Southern Italy (Price 1992: 467).

§6. Traces of the quinary system have been sought in the numeral "10" reconstructed usually as **dek̂m̥t*, which should consist of the numeral "2" and the word "hand" (Gothic *handus* etc.) – see Szemerényi 1960: 69. In the chapter about the Indo-European numeral "10" I tried to demonstrate that this derivation is not possible (I reconstruct the forms **dek̂m̥* & **dek̂m̥t°*, seeing in them the derivatives of **dek̂-* "to reach, accomplish"); the numeral "2" cannot be reconstructed without **-u-/-w-* while the vowel **-e-* in "10" never appears in any form for "2". And why is "hand" not in dual ? Another attempt has to do with Old Irish *dëak* used for teens '11–19'. It was derived from hypothetical compounds: the adverb **dwi-penkʷom* or the gen. pl. in **-ōm* (Pedersen) or from the dual **dwei-penkʷou* (Pokorny). The most convincing and elegant solution was presented by Hertz and Schrijver (Ériu 44[1993]: 181–84 with older citations) based on **dek̂m̥* "10" + **-kʷe* "and", i.e. the form which is absolutly logical in formation of teens. And so the only case when "10" represents demonstrably "two hands" is Ishkashim (an Iranian language from Pamir) *dI dûst* (Payne 1989: 435). But one trace of the quinary system can be identified even for the common Indo-European level. If my analysis of the numeral **Ksweḱs* "6" is correct (**ĝʰs-weḱs*), it represents a compound of **ĝʰes-* "hand" & **weḱs-* "to grow", hence *"overgrowing the hand". Unfortunately it cannot be verified on the basis of the following numeral **septm̥*, if we accept its Semitic origin.

§7. The creation of the Indo-European numerical system could have developed according to the following scenario:

1. Judging from the external parallels, the most archaic Indo-European numerals were **[H]oy-* "one (of two)", **sem-* "one, unit", **du-* "two". Applying the same criterion, the roots of the ordinals "1st" and "2nd", viz. **pr̥H₂-* and **H₂el-*, also belong here, although their primary meanings were "foremost" and "another" respectively.

2. The semantic motivation of the following numerals, "3" & "4", was based on fingers or spans, concretely **t(e)r-i* *"[finger] on the protruding position" → "third finger" → "three" and **kʷetwr̥* *"span [consisting of four fingers ?]" → "four" or *"set of fingers" → "four". The meaning *"little [finger]" (→ "fourth [finger]" → "four") should also be taken in account. The latter possibility can be supported by Anatolian **meyu-* "4", probably also *"little [finger]", cf. Greek *μύωψ* "little finger" (Oppianus Anazarbensis, *Halieutica*). Finally, the original coumpound **meyu-kʷetwr̥* "little finger" is also thinkable.

3. If **penkʷe* "5" denotated primarily *"keeps [all fingers] in the fist", it would imply that the numeral "5" closed the series "1" – "5", hence at that time the counting system was quinary. It can probably be supported by the following numeral **Ksweḱs* "6", if it is derived from **ĝʰs-weḱs* < **ĝʰes-* "hand" & **weḱs-* "to grow", i.e. "overgrowing the hand".

4. The numeral **septm̥* "7" has no convincing Indo-European etymology. This fact indicates the possibility of its foreign origin. The most probable source seems to be Semitic **sabʕatum* "7", derivable from the name of the "forefinger" (Arabic *sabābat, sibbat, sabbāḥat*).

5. The numeral **H₂oḱtoH₁(u)* "8" represents the dual of **H₂oḱ[e]to-*, originally probably "set of points", metaphorically "set of fingers", or "set of knuckles on back of the hand".

6. The semantic motivation of the numeral **H₁newm̥* "9", namely "in lack" (adv.), implies its creation at the same time as the numeral "10" or even later, because it depends on the use of "10". And finally, the numeral "10" completing the whole decad expressed *"in the end" (adv. **deḱm̥*), or *"reaching, accomplishing" (participle-like **deḱn̥t-*). The decimal system was complete.

7. All higher numerals less than "1000" represent compounds of the numerals of the first decad. The common pattern for tens and hundreds (with exception of Anatolian where these forms are not known) indicates that it belongs to the common (at least late) Indo-European level.

8. The highest numeral continuing at least in three Indo-European branches is "1000". The form **(sm̥-/*smī-)ĝʰeslo-/ī* preserved in Indo-Iranian, Greek, Italic and Celtic is older, while **tūs(ḱ)ont-* (~ *-n̥t-*) **ḱn̥tī* (~ *-yā*) *"strong[est] hundred" limited only to the 'Northwest block' is evidently innovative. It is remarkable that the common Indo-European pattern for the formation of decads is also replaced by innovations exactly in the branches of the 'Northwest block'.

III. Conclusion:

The analyzed numerical systems demonstrate that the primary semantic motivation of numerals was based on body part names. The higher numerals originate by means of elementary arithmetic operations combining them. The limits of the used comparative-historical method depend not only on the level of our knowledge, but also on our ability to differentiate the real etymologies and the 'Volksetymologies'. The chosen examples represent only a small fragment of the incredibly rich abundance of various systems of numerals. But I believe they allow us to illustrate the difficult process of creation of numerals and counting as an attribute of modern human society in general. It is evident that numerals originated independently, on the basis of various concepts, due to imagination of generations of their creators, depending on the development of the natural and especially social environment. The creation of numerals confirms more than any other human activity that **man is a measure of himself.**

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N U M E R A L S

COMPARATIVE — ETYMOLOGICAL ANALYSES OF NUMERAL SYSTEMS AND THEIR IMPLICATIONS

(Saharan, Nubian, Egyptian, Berber, Kartvelian, Uralic, Altaic and Indo-European languages)

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